Trains

35¢

America's Distinguished Railroad Magazine

September, 1947

Enthusiastic? You Bet!

THERE'S plenty to be enthusiastic about in the Southland served by the 8,000-mile Southern Railway System.

As an all-around vacationland it's hard to beat.

And it's "tops" as an exciting opportunity-land for industry and business. Here, industry is thriving on abundant natural resources, fast-expanding markets and all the other factors that favor continued growth and prosperity. Here, industry is facing the future with enthusiasm and confidence.

If you're looking for greater industrial opportunity, you'll find it difficult to curb your enthusiasm when you *"Look Ahead —Look South."*

Ernest E. Norris
President

LOOK SOUTH LOOK AHEAD

SOUTHERN RAILWAY SYSTEM

The Southern Serves the South

Trains

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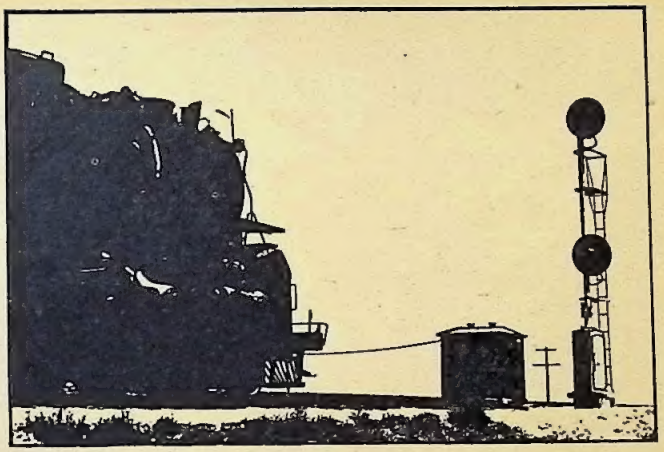

"Why has the railroads' contribution to economic progress been greater than that of other agencies of transportation? The answer is that railroads go everywhere and they carry everything. They handle bulk freight, package freight, perishable freight, passengers, express and mail. Their service is speedy, cheap, and more dependable than that of any other mode of transportation. They operate on fast schedules 24 hours of every day. Their services are rarely interrupted by storms or other weather conditions. Their service can be made to fit every transportation need."—J. R. Coulter, Chief Traffic Officer, Frisco Lines.

Volume 7, Number 11

September 1947

Cover Photo. B&O Class P-1d 4-6-2 at Cumberland, Md. - - 1
By William P. Price.

Railroad News and Editorial Comment. By A. C. Kalmbach. - 4

Lehigh & Hudson River at Lake, N. Y. Special photo feature. - 12

Begin CTC. By Linn H. Westcott. - - - - - - 14
The inside story of centralized traffic control.

Photo Section. Selected railroad photographs. - - - 29

Westward HO by Railcar. By Squire Knowles. - - - 40
A trip over the California Western Railroad & Navigation Co.

The New York Central and How It Grew. By Alvin F. Harlow. - 47
Present-day NYC consists of 650 companies.

Corporate Parts of the New York Central. Map by W. A. Akin Jr. 48

Ocean Shore Railroad. Special photo feature. - - - 61

Short Features. - - - - - - - - - 65

Railway Post Office. Letters from readers. - - - - 66-70

New Railroad Book. A review of "My American Pilgrimage." - 70

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More Trains on Main Lines

Ralph Budd, president of the Burlington, told his stockholders at their recent annual meeting that he would cut off 10,000 miles of branch line passenger trains if he could get permission. He said: "Revenues of these trains are down 75 per cent as against a system average of 47 per cent."

It is more and more of a problem for railroads to make money with branch line passenger trains. Not so many years ago the rule of thumb was $1 a mile. All it took was a reasonably good R. P. O. contract, a little express business, and a few paying passengers to cover the out-of-pocket cost. But costs went up. Two years ago the rule of thumb was $1.50 a mile. Now the talk is $2 a mile to keep a passenger train rolling. Even with a postal contract that's a lot of money to dredge out of typical branch line territory.

So the railroads hunt for money where money is. You'd do the same thing. People travel by the hundreds and thousands between big cities. They travel only by the dozens in branch line country. It costs little more to run a mainline limited than to run a two-car local. On many roads the same five-man crew is required at some 40 to 50 cents a mile. The railroad's working capital is limited, so it spends its money where there is the best chance for filling up the most coaches.

However, the dropping of branch line trains has given many of us the impression that the railroads are getting out of the passenger business. This isn't true. By and large, mainline passenger traffic has increased immensely in recent years. More trains run; they carry more cars and more people. The railroads aren't getting out of the passenger business. They are merely concentrating on the type of passenger business which can best meet expenses. A comparison of mainline schedules over the last several decades shows clearly the trend of the mainline passenger traffic. Let's look at some of the country's most popular intercity journeys, comparing the number of through trains operated in 1910 and 1928, both boom years for traffic, and the current 1947 timetables:

	1910	1928	1947
NEW HAVEN			
New York-Boston (Shore Line)	20	32	41
NEW YORK CENTRAL			
New York-Buffalo	25	26	32
New York-Chicago (via Cleveland)	17	17	17
New York-Chicago (via Detroit)	10	13	6
Chicago-Cincinnati	10	13	11
Detroit-Buffalo	15	17	13
PENNSYLVANIA			
New York-Washington	31	44	45
Philadelphia-Washington	48	51	50
New York-Philadelphia	82	104	*96
New York-Chicago (via Ft. Wayne)	12	11	18
New York-Chicago (via Pan Handle)	4	2	--
New York-St. Louis	11	11	12
MILWAUKEE ROAD			
Chicago-Milwaukee	21	25	27
Chicago-Minneapolis	11	13	15
CHICAGO & NORTH WESTERN			
Chicago-Milwaukee	23	30	26
ALTON			
Chicago-St. Louis	8	14	13
UNION PACIFIC-SOUTHERN PACIFIC			
Omaha-San Francisco	5	9	†6
SANTA FE			
Chicago-Los Angeles	7	13	9
SOUTHERN			
Washington-Atlanta (main line)	8	12	14
BALTIMORE & OHIO			
Washington-Chicago (main line)	4	8	9

*Many through trains have been taken off the New York-Philadelphia timetable because headway is already close enough.

†Plus three times weekly streamliner *City of San Francisco*, which will go on a daily basis September 1. This train operates over the Chicago & North Western, Union Pacific, and Southern Pacific railroads and is jointly owned by all three.

When we check behind the figures we find even more contrast between train travel of 1910 and of 1947. For instance in 1910 four of the New Haven's through trains between New York and Boston were little more than locals, leaving only a couple of minutes behind all-Pullman expresses and taking an hour longer for the run. If we analyze the New York Central mainline New York-Chicago table for 1910 we find only four through trains that anyone would ride all the way. The others were evidently designed for head-end and local traffic.

All the way through the *Official Guide* the improvement in numbers of real, honest-to-goodness through trains on important runs has been as great as the improvement in equipment over the last several decades. And this takes no account of the greater number of cars per train in 1947.

It's not that the railroads are getting a larger share of the business than they did in 1910 or 1928, but simply that the American people are traveling more. Everyone is on the go. True, there is more competition for this travel, but in their natural field of medium and long distance travel the railroads are getting their share, and they are definitely still in the passenger business.

Committee Plans New Chicago Passenger Terminal

If means can be found to finance the project, Chicago may some day have a new union passenger terminal to replace the three stations south of the Loop and the lake front station of the Illinois Central. Three possible sites for a new terminal have been picked by a Railway Terminal Committee made up of representatives of each of the 17 interested railroads and the City of Chicago. Fred Gurley, president of the Santa Fe, has been principal spokesman for the group. Representative for the city is Joseph D'Esposito, a consulting engineer, who took part in building the present Union Station and the Chicago subway.

Many meetings have been held and progress made in over-all planning, but the terminal still appears a long way off. One point upon which there is agreement is that any future terminal should have depressed tracks to avoid street closing or the "Chinese wall" of embankments. It has been suggested that tracks be eight feet below present street levels. Thus every street could be kept open by a viaduct over the low-level tracks. This is the way the situation was handled at the present Union Station.

The 17 railroads involved operate 328 mainline trains in and out of Chicago every 24 hours. LaSalle Street Station, used by New York Central, Rock Island, and Nickel Plate, is by far the busiest, with 149 trains daily. It is also the newest of the south Loop stations, and the only one on the el-

Keeping Pace with a Production Peak

● America's production curve has climbed to an all-time peacetime peak!

Keeping pace with this performance has kept the railroads coming and going: coming to factory and mill with the raw materials industry needs; going to market with the finished products.

Add to this industrial production peak a record-breaking performance by the American farmer and you get a measure of the job the railroads are doing. During the first six months of this year, your railroads hauled *more tons more miles than ever before in peacetime!*

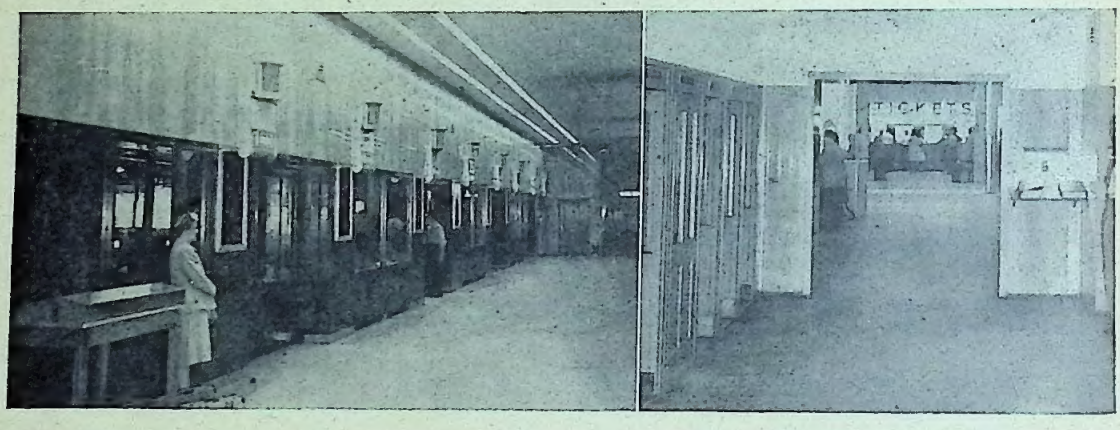
When the war ended, the railroads had on order 35,000 new freight cars. Since that time, these cars — plus another 40,000 — have been built, and the railroads have ordered *still another* 105,000. But it has not been possible to get these cars built fast enough to replace those worn out in wartime. As a result, today the railroads are hauling this biggest peacetime traffic in history with fewer cars than they had on V-J Day.

More cars are on the way. Until they arrive, however, railroads must do the best they can with what they have and can get. There are bound to be some delays in furnishing all the cars needed by American industry today. But you can be certain that the railroads — with the continued help of the shippers — will keep on doing their level best to speed these products to the market places of the nation.

AMERICAN RAILROADS

THE NATION'S BASIC TRANSPORTATION

Chicago's 62-year-old Dearborn Station is completely remodeled and redecorated. The new mezzanine waiting room has a large opening↑ in the center which looks into the main concourse. Passengers in the waiting room↑ can watch the activities in the train shed from "observation windows" in the south wall. These windows form an ideal vantage for railfans to review the array of colorful trains using this veteran station. Directly below in the concourse are attractively designed train gates↓ with double sliding doors. These enhance the appearance of the concourse. The telephone room↓ opens into the ticket lobby. It has clean marble walls and terazzo floors. Dearborn Station is used by trains of the Santa Fe, Erie, Monon, Chicago & Eastern Illinois, Grand Trunk Western, Wabash, and Chicago and Western Indiana railroads.



evated railroad. Dearborn is the oldest station but has been rebuilt recently with one of the most attractive interiors of the group. It is used by the most railroads, Santa Fe, Grand Trunk Western, Monon, C&EI, Wabash, and Erie, plus a few suburban trains of the jointly owned terminal company, Chicago & Western Indiana. The total of through trains is 76 daily. Dearborn Station causes the most trouble to the city from a traffic standpoint, for its tracks cross a number of busy streets at grade. The Illinois Central, or Park Row, station is on the lake side of Michigan Avenue, where it does not interfere with street traffic in the slightest. The location is farthest from the Loop business district of all railroad stations, and the longest transfer run for interchange passengers from other railroads. besides the IC, it is used by Michigan Central and Big Four, with 75 trains daily. The impressive Grand Central Station of the B&OCT is least busy of all Chicago stations. Only 28 trains a day arrive and depart on its four railroads, Baltimore & Ohio, Pere Marquette, Chicago Great Western, and Soo Line.

If the dream comes true of a unified station to replace these four, it will of course be larger than any one, but it will be on approximately the site of either the present LaSalle Street, Illinois Central, or Dearborn stations. The LaSalle Street site involves a proposed 26-track stub layout which might cause operating difficulties. The other two proposals are for through tracks.

The second proposed terminal would be at the southeast corner of Michigan Avenue and Roosevelt Road with the main entrance on Michigan. Here, too, 26 tracks would be involved. But, since they would be through instead of stub, fast movement could be expected. After a train unloaded, it could pull north of the terminal, off station trackage, switch over to a

passing track, and another arriving train could occupy the track within a few minutes after the first train had unloaded.

The final location mentioned by the committee would be just south of Polk Street, with the main entrance facing on Dearborn Street, and a station plaza running from Dearborn to State Street. This site also would have the 26-track setup, all of the through type, such as for the Roosevelt Road location.

This last site, naturally, would be favored by the lines using the present Dearborn Station, since the rearrangement involved would be much less complicated for them than if they were to move over to, say, Roosevelt. Those using Central Station are in favor of the Roosevelt site for the same reason. Naturally, some revisions will have to be made regardless of where the terminal finally is located, but they will be less if some of the present trackage can be salvaged.

Outside of coming together on a site for the new terminal, the main drawback probably will be the rearrangement of trackage of the roads involved. Coach yards of all lines are now located at points convenient to present terminal sites. These, too, would have to be rearranged, or connecting trackage built, so the various roads could get trains made up, cleaned and serviced before backing into the terminal. Signal facilities will be complex and costly too.

The approach tracks of such a terminal should be something well worth seeing, when, and if, it ever comes to pass. It would be a photographer's dream to snap a picture of, say, the *Panama, Century, Capitol Limited, Kansas City-an*, and other famous trains, coming into the throat tracks simultaneously, and then slipping off into their proper tracks in the terminal.

It has been estimated the cost of revamping facilities for a new Union Terminal would come to $150 million. This figure does not include the cost of the terminal proper, but represents only the money that would be spent by the railroads for rearranging trackage, new signal facilities, tower operations, facilities for handling mail, baggage and express. Due to unsettled price and labor conditions, interested parties will not even venture a guess at the cost of the terminal building proper. The city itself would cooperate with the roads to the extent of making available a right of way for the depressed trackage, and also by helping to acquire the site.

At the present time, the prospects of the Union Terminal hinge on two important details: First, getting the interested parties to agree on the site, since it is doubtful if any of the roads would cheerfully give up their present terminals; and, second, the terrifying figure of the dollar sign — $150 million for the rearrangement costs. With passenger traffic a question mark just now, no one wants to sink a huge amount of needed cash into a project which will be long in paying itself off.

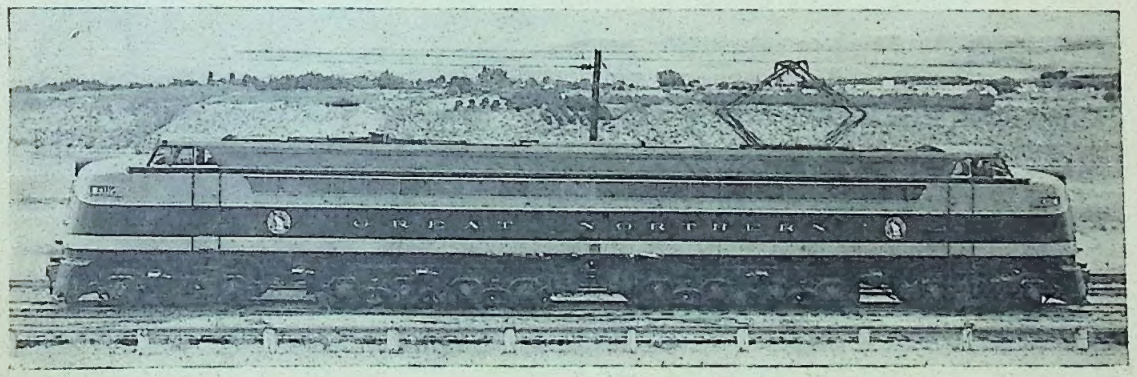
Pullman Through New Orleans

Pullman car service from New York to Los Angeles with through-car advantages was inaugurated by the Southern Pacific in conjunction with the Pennsylvania, Atlanta & West Point, Louisville & Nashville and the Southern. Passengers on the Washington-Sunset Route change cars at New Orleans, but their baggage is changed to another Pullman with the same car number while they tour the city. Train schedules permit a stop of seven hours eastbound, and four hours westbound, in the "Crescent City."

Odds and Ends

A new all-time daily record of passenger traffic through Grand Central Terminal was established Thursday, July 3, when 252,251 people arrived or departed from that station. . . . New escalators in the Kansas City Union Station eliminate eight stairways. . . . The ashes of Charles M. Faupel, retired inspector of special agents for the North Western Railroad, were dropped from the *Capitol 400* between Chicago and Milwaukee. Before he died Faupel asked that his body be cremated and the ashes strewn along the right of way.

The film "Whistle in the Night," produced by RKO-Pathe with the aid of the Association of American Railroads, is completed and released for showing in more than 9000 theaters all over the country. It is a two-reel documentary film which runs for about 17 minutes and tells a behind-the-scenes story of what the railroads do. The flicker has some good scenic views and interesting shots of railroad shops and equipment. . . . Grand Trunk Western cabooses now have Bibles as part of their standard



This is one of the two single-cab electric locomotives in use on the Great Northern 73-mile electrified section between Wenatchee and Skykomish, Wash. These new engines, designed for both passenger and freight operation, are 101 feet long and have a continuous rating of 5000 horsepower. They pull 2000-ton trains without a helper up the 2.2 per cent grades.

equipment. The Bibles are a gift of the Gideons International.

Locomotive Notes

Nickel Plate has placed an order with Alco for 11 2000-horsepower diesel passenger locomotives. The new engines will be used between Buffalo and Chicago and between Cleveland and St. Louis. . . . Baltimore & Ohio has purchased 10 highspeed 2-6-6-4 articulated locomotives from the Seaboard Airline Ry. After minor adjustments in the B&O's Baltimore and Cumberland shops they will be put in fast freight service between Cumberland and Brunswick, Md. The B&O also has purchased 13 Mountain type engines from the Boston & Maine. These steam engines, with 67,000 lbs. tractive power, 73" drivers, and a tender capacity of 21 tons of coal and 20,000 gallons of water, compare favorably with the B&O's present Mountain type power. They will be used in fast freight service between Chicago and New Castle, Pa. The freight power on the road will be further augmented in the first quarter of next year by delivery of 20 new 3000-horsepower diesel locomotives, now under construction at Electro-Motive.

Virginia & Truckee acquired Consolidation No. 5 of the abandoned Nevada Copper Belt Railroad, reports Lucius Beebe. Beebe snapped the heavy duty locomotive for *Mixed Train Daily*, a book of short lines, which he and C. M. Clegg will publish this month. V&T's No. 25, the road's show locomotive, has been sold to Paramount and its purchase price applied to the acquisition of the Nevada Copper Belt engine. . . . Norfolk Southern bought five modern diesel switching locomotives, and is now arranging to acquire 10 diesel road freight engines. The new motive power is part of the NS's modernization program.

Georgia's New Streamliners

"Some folk say the Nancy can't run;
But stop, let me tell you what the Nancy done;
She left Atlanta at half past one,
And got to Savannah at the settin' of the sun."

Georgia's latest streamliner, *Nancy Hanks II*, is the second train to bear that illustrious name. The first *Nancy*, a steam-powered train painted in royal blue and trimmed with gold leaf, was named after the famous mare who covered a mile in 2 minutes 4 seconds. The train became a tradition in the South and lives to this day in the Negro ballad quoted above.

The new *Nancy*, like its predecessor, links Atlanta with Savannah, a run of 294 miles. It is one of two new diesel-powered streamline trains of the Central of Georgia. Coaches are of the latest design with specially designed daylighting which evenly diffuses the sun's rays throughout the cars. A grill-lounge car is featured.

The other streamliner, *Man o' War*, likewise named after a famous horse, runs between Atlanta and Columbus. Its equipment generally duplicates that of *Nancy*. Both trains were exhibited at various points along the line and attracted great interest. With the new equipment and interstate round-trip coach fares at little more than the one way rate, the CofG makes a strong bid for increased business.

Equipment Notes

Norfolk Southern has 250 all-steel box cars on order. . . . Atlanta & West Point, Western Railroad of Alabama, and the Georgia Railroad will each receive 50 new box cars. Future plans call for modernization of six A&WP-WRRofA passenger cars at a cost of $90,000. . . . Atlantic Coast Line has authorized inquiries for bids for the construction of 4000 freight cars. Most of the new rolling stock will

The *Nancy Hanks II* is welcomed at Millen, Ga. See story on this page. Truman Blasingame, P. O. Box 917, Augusta, Ga.

YOUR passenger train conductor is a familiar figure . . . but did you ever think about a *freight train* requiring the services of a conductor?

From his "office" in the red caboose, the freight train conductor directs the handling of as many as 100 freight cars that make up his train. He makes certain that cars are dropped from the train at their proper destination and others picked up, that the products they carry arrive safely and in good condition.

The Erie Freight Conductor gets a quick, concise picture of his train from a teletyped control sheet. This list tells him the contents, consignee and destination of each car. The same information is flashed by teletype to stations ahead, and to a central office in Cleveland.

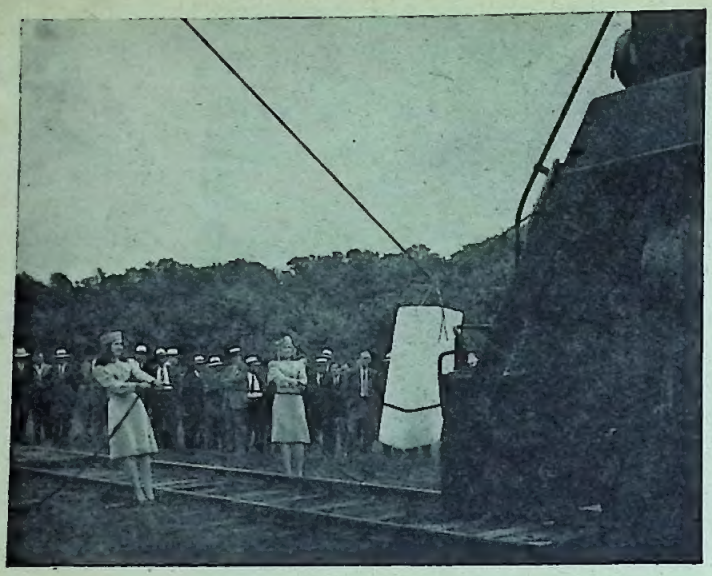
With this teletype control system, the Erie can quickly tell shippers the present location and scheduled arrival of their shipment.

Modern, up-to-date methods such as this are responsible for the Erie's reputation among shippers everywhere for efficient handling, dependable service.

Erie Railroad

Serving the Heart of Industrial America

ERIE



Ice is substituted for the conventional champagne to dramatize resumption of service and reopening of an icing station on the Toledo, Peoria & Western. The TP&W was strikebound for 19 months. Its new president, Russell Coulter, succeeded George P. McNear Jr., who was assassinated on March 10.

be box cars, and the remainder, an assortment of gondolas, flats, coal, rock and cement vehicles.

Production of domestic freight cars reached a five-year high in June with the construction and delivery of 5514 units, compared with 3929 in May. . . . New York Central ordered another 1000 new box cars. This brings the total number of box cars on order by NYC to 5000. . . . Reading Company placed an order for 1000 50-ton box cars with American Car & Foundry. . . . Northern States Power Company will acquire four 70-ton triple hopper cars from ACF.

Railfan Trips

[Send notices by 5th of the month for following month's issue.]

September 13, 14: Northwestern Pacific and California Western railroads. Leave San Rafael, Sept. 13 at 8:20 a. m., arriving Fort Bragg late same afternoon. Overnight accommodations available to persons making advance reservations. Train will make side trip to logging camp at Ten Mile the following day. Leave Fort Bragg 1:00 p. m., and arrive in San Rafael about 8:00 p. m. Rail fare $10.75 including tax. Special buses to be operated from Oakland and San Francisco, $1.50 round trip. Hotel reservations extra; specify double or single. Tickets and reservations obtained from Stanley Merritt, 836 Alma Ave., Oakland, Calif. Trip sponsored by Pacific Coast Chapter, Railway & Locomotive Historical Society.

September 21: Reading Co. secondary lines including Perkiomen and Wilmington & Northern branches. Photo stops en route including shops at Reading, Pa. Leave Reading Terminal, Philadelphia, 8:30 a. m. (DST); fare $4.24 including tax. Details from Henry Dickinson, Jr., National Railway Historical Society, 109 W. Ashland Ave., Glen Olden, Pa.

September 21: Union Pacific to Barstow and Yermo duplicating "railfan rodeo" of prewar days. Contact A. Wayne Melching, Railroad Boosters, P. O. Box 5279, Metropolitan Station, Los Angeles 55, Calif.

October 4-6: Trip over Virginia & Truckee leaving Oakland after dinner Oct. 4, arrive Reno, Nev., in time for breakfast; take V&T all day. Return to Reno in time for dinner. Depart about 9:00 p. m., arrive Oakland about 7:00 a. m., Monday. Fare approximately $15, coach; $20, intermediate, depending on type of berth. Write Ray Tufveson, California-Nevada Railroad Historical Society, 2045 E. 14th St., Oakland 6, Calif.

October 5 (or 12): Boston & Maine Railroad 400-mile trip around the mountains of New Hampshire. Leave North Station, Boston, about 9 a. m. Further details in October TRAINS or write Cyrus Hosmer, Jr., Trip Chairman, New England Division, Railroad Enthusiasts, 34 Chester Rd., Belmont 78, Mass.

October 12: Lehigh Valley Railroad over back-country lines of the Hemlock, Naples, and Seneca Falls branches. Write Edw. Levandoski, Co-director, Buffalo Chapter, National Railway Historical Society, 18 Kopernick St., Buffalo 6, N. Y.

Family Names for Trains

Why did the *Hiawatha* have papooses? Why has the *400*, originally named that because it covered 400 miles in 400 minutes, become a fleet of *400's*, most of which run neither 400 miles nor 400 minutes? And what's become of the grand old train names with atmosphere, such names as *Overland Limited* and *Atlantic Express?*

These are a few of the questions raised in a very interesting letter from Donald Kotz, Kenosha, Wis. He thinks that the identities of individual trains are being lost in the shuffle as whole fleets become *Zephyrs* or *Rockets*. I'm inclined to agree with him.

But there is much to be said on the other side too. A railroad with a smash hit on its hands, like the original *400*, or the original *Zephyr*, naturally wishes to carry the same valuable publicity over to other new trains of the same type. It isn't the same thing as the old days, when a train was a train and one name in a fleet could not be re-used to add distinction to other members of the fleet.

When the New York Central started the *Empire State Express* and the *Twentieth Century Limited*, each was a distinct identity, and there would have been no publicity value in creating a family of names. But the first streamliner on each road broke so completely with tradition that its name became a byword for a special, new type of equipment and service. It was wise to capitalize on the value of that name when other similar trains were started.

As for me, however, it's too much wordage. I call the *400's* by their first names, the *Peninsula*, the *Commuter*, and so on. I suppose soon I'll be calling the *Olympian Hiawatha* just plain *Olympian*. And I like to tack *Limited* back on the *Overland*.

Freight Trains Too Fast?

Railroad freight service has certainly improved in recent months. Gunnison Homes, the big prefabricated housing plant at New Albany, Indiana, finds that sometimes a carload from its plant gets to destination before the sight draft which has been mailed to the dealer. In several cases, Gunnison dealers have actually had to pay demurrage on cars of prefabricated houses while waiting for the sight draft to catch up with the freight service.

Slightly Restricted

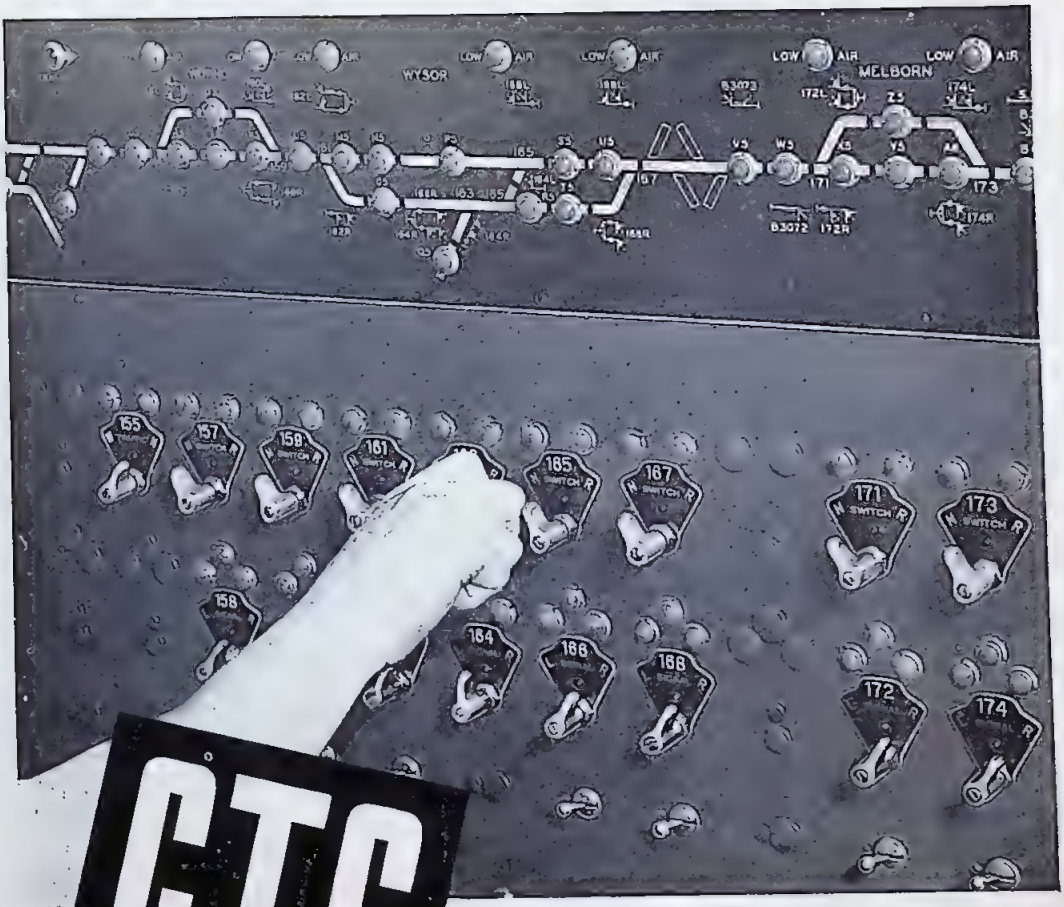
The ingenious proprietor of a small 10-mile coal road asked to exchange passes with one of the big passenger-carrying lines. Because of the interchange coal traffic, the pass was granted, but when it came back it was marked "Not good on extra-fare trains."

Not to be outdone, the proprietor of the 10-mile road sent back a pass on his road marked "Not good on passenger trains."

A. C. Kalmbach.

Lehigh & Hudson River at Lake, N.Y.

The Lehigh & Hudson River Railway is a freight-only Class 1 railroad operating 86 miles of line between Maybrook, N. Y., and Easton, Pa., and a nine-mile branch from Andover to Port Morris, N. J. Fifteen miles from Maybrook, engine 94 pulls an Easton-bound freight from the passing siding at Lake, N. Y., the shadow of its smoke making an interesting pattern on adjacent pasturelands. Photograph by Donald W. Furler, 94 West Main Street, Glen Rock, N. J.



CTC .. to Serve You

This is C. T. C.—Centralized Traffic Control. At panels like this, experienced dispatchers set signals and switches that control train movement over many miles of the Norfolk and Western system. Lights on a panel, flashing on and off, show the location and progress of all trains at all times. The dispatcher flips a little lever, and 100 miles away a switch is set and a signal changes . . . a train moves onto a siding to allow another to pass, and moves back again, onto the main line.

This is foolproof control. The track, in miniature, is before the dispatcher. Controls are so devised and interlocked that it is impossible to show conflicting signals. No change in train movement can be made, until it can be made safely.

C. T. C. is the result of many years of study plus the application of the most improved signal apparatus yet developed. You never see it, as you or your freight move over the railed miles. But it is there — one of the unseen, unheralded reasons for better railroading — *to Serve You.*

Norfolk and Western Railway

PRECISION TRANSPORTATION

Begin CTC

BY LINN H. WESTCOTT

A dispatcher with CTC machine can save trains a minute a mile. His track will handle 50 per cent more traffic and train orders are no longer needed

July 25 this year was a day for celebration at General Railway Signal Company in Rochester. Twenty years ago GRS men helped the New York Central install the first "centralized traffic control" machine. This control panel was placed at Fostoria, Ohio, and it was wired directly to every passing track switch and signal between Stanley Yard and Berwick. Stanley is near Toledo and Berwick 40 miles south on NYC's Ohio Central lines. Much of the coal from West Virginia for Detroit's automobile plants as well as the trains to and from Cincinnati roll over the line. Traffic was so dense in the middle twenties that NYC engineers planned to double-track the line. The control machine handled the traffic so well that the money set aside for a second track was used for other needs.

The words "centralized traffic control" are usually shortened to CTC. With CTC a dispatcher can direct all train movements by merely moving small levers, pushing buttons, and watching red and green lights on the panel before him. The real advantage of centralized control is that it is much faster than the usual train order system of dispatching trains.

With train orders, many time-consuming operations must be made when the dispatcher wants to make a move that is not in the timetable. Suppose, on a hypothetical railroad, the *Osage Limited,* eastbound No. 2, is scheduled to meet the *Day Express,* westbound No. 7, at Selfridge at 8:31 a.m. But this day the *Osage* is running 19 minutes late, and dispatcher Dugan wants to prevent it from unduly delaying the *Express.* He decides that instead of the trains meeting at Selfridge, they should meet at Paxton 7 miles farther west. Without an order the *Day Express* must stay at Selfridge because it has no way of knowing the *Osage* is running late. But Dugan can't give the *Express* an order to continue beyond Selfridge until he is definitely sure that the *Osage* will wait at Paxton. These trains are shown in the top two drawings on page 24, and here's what happens with train orders:

1. Dugan writes out an order that can have no misinterpretation. "No. 2 will wait for No. 7 at Paxton."
2. Dugan telephones or telegraphs the order to operator James Kelley at Susanville, the next station ahead of Paxton.
3. Kelley sets the train order semaphore above the station to stop train No. 2.
4. Kelley makes copies of the order and reads it back to Dugan as a double check.
5. When the Osage, No. 2, arrives at Susanville, Kelley delivers the order to the conductor and enginemen, and gets their signatures to show that the men understand the order.
6. Kelley wires the signatures back to Dugan. This assures the dispatcher that the Osage will wait at Paxton.
7. Dugan then sends the order to the operator at Selfridge to be delivered to the crew of the Express.

By this time the *Express* may already have pulled into the side track at Selfridge expecting to let No. 2 go by. With further delay, it throws the switch to get back on the main, pulls ahead, throws the switch behind the train, and then runs on for the meet at Paxton. No. 7 may lose 10 minutes or more.

This crude example is only one of many things that can happen to cause delays. Not all train orders have to be signed, either, but in almost every case, one train running late is likely to delay every other train on the line.

With CTC no operators are needed at sidings because signals deliver the "orders," and lights on the central control panel automatically show the dispatcher where every train is. Here's how Dugan handles the same situation with a CTC control panel. The panel is shown on page 25, and the train movement corresponding, on page 24.

1. He turns levers on the central control panel to put the Osage into the siding at Paxton and to clear the signals for the Express to run through Selfridge.
2. When the Express reaches Paxton at 8:41, he again throws levers to let each train continue on its way.

Each of these operations takes four seconds. The dispatcher throws all the switches for the trains and saves them time because it takes between six and eight minutes for a train to get in or out of a siding when switches are thrown by hand. The *Express* never stops at all, so it is not delayed in any way. Since it reaches Paxton earlier than it would under train orders, the *Osage* is able to get going sooner than before.

As a matter of fact, many meets between trains in CTC territories are made without either train having to stop. These are called "running meets," and dispatchers are proud of the number they can make in a day. On many CTC lines, more than half of the meets are running meets, and on one of the Santa Fe's CTC districts where fairly long sidings are used, 8 out of 10 meets are made without stopping trains.

This district is dispatched from an office in Amarillo, 98 miles from the nearest part of the CTC territory. The CTC track is between Canadian, Texas, and Waynoka, Oklahoma, 110 miles apart. On the 2nd of last March there was a typical train movement that showed another way in which CTC is proving its usefulness. At 9:00 a.m. an east-

Eastbound Southern Pacific trains enter CTC track at Vista, Nev. K. E. Kellenberger of Union Switch & Signal Co.

bound freight, No. 5035-E, was authorized by signal to leave Coburn near the west end of the district. It left 10 minutes ahead of No. 2, the *Scout*. At Fargo the freight made a running meet with No. 23, the *Grand Canyon Limited*. By this time, 9:45 a.m., the freight was 17 minutes ahead of the *Scout*. It made another running meet with No. 5017-W at Heman and continued to Waynoka where it entered the yard at 10:55. Elapsed time for the 89 miles was 115 minutes, an average speed of 46 miles per hour. The *Scout's* schedule is not this fast. It arrived at Waynoka at 11:40 with an average speed of 36 miles per hour.

Under train order operation, the crew of the freight would have waited at Coburn to let the *Scout* go by. They would have reached Waynoka at about 11:50 at an average speed of only 31 miles per hour. CTC on only 110 miles of Santa Fe's long route made it possible for that train of California products to reach Chicago at least 55 minutes sooner. Several other long stretches of this main line have CTC, and a new link is under construction west of Amarillo.

The 20 or so freight trains that run each day used to take from 7½ to 8 hours on the 110-mile run between Canadian and Waynoka. Now they make the same trip in 3½ to 4 hours. The time saved comes from an accumulation of advantages that CTC provides. For example, in 1943 one out of every 56 trains broke in two somewhere along that line. With CTC installed on only part of the division, that type of delay now occurs only to one in 257 trains. Each time a train breaks, the main line is likely to be blocked for an hour, delaying other trains as much as six hours.

The reason CTC reduces train breaks is that many meets are made running, and no stops are made at sidings to throw switches. This fact came as a surprise to NYC's car repairmen when they noticed fewer drawbars were being broken on trains running over the pioneer CTC line.

NYC had another happy surprise when a bad storm knocked down 600 telephone poles in the first winter of CTC operation. All telephone lines were dead, but the strong bullet-proof cable carrying CTC wires was intact. Trains were hopelessly jumbled on the parts of the line operated under the train order system; but the CTC dispatcher was able to help straighten them out in his territory. Of course, if the CTC cable had broken, NYC would have suffered even more.

Modern CTC does not have to depend upon a cable, for emergency connections can be made by commercial telephone or radio. A year ago, Union Switch & Signal Company engineers performed an experiment to prove how practical it is to tie in commercial lines for CTC control during an emergency. Between Brady Tower and Oil City, the Pennsylvania operates a modern CTC district. Ordinarily the signals and switches are controlled by the machine in Brady Tower over two direct wires. For the experiment, the engineers broke the connections between the machine and the wires. The machine's control impulses were sent around a 1000-mile circuitous route via railroad telegraph,

Union Switch & Signal Co.

This is the beginning of CTC territory running north from Las Vegas, Nev., to Caliente, on the Union Pacific's Los Angeles & Salt Lake route↑. Most end of siding locations are like this with four signals, relay house, and powered switch. The Begin CTC sign shows where operation under train orders or yard limit rules ceases and operation by signal indication begins. Orders are now issued only for a slow-down. At Meacham, Oregon, CTC helps three UP trains meet↓.

Union Pacific.

Josef Muench, Santa Barbara, Calif.

At Walong, Calif., in the Tehachapi Mountains, Southern Pacific track leads heavy freight and passenger trains around a loop to gain altitude. The lower end of Walong side track is near the point where the two levels cross. Before CTC, semaphores↑ and a spring switch were located in the narrow granite cut. The signals were raised onto a bridge→ when CTC was installed. This improved visibility. Metal shed in the distance houses relays and batteries. The Santa Fe trains shown use this line by trackage agreement.

Western Union carrier, and radio from Brady to Washington to New York and back to the regular CTC wires. In time of flood or other disaster, a CTC machine could be connected in the same way with any parts of its lines if wires were down.

While the New York Central and General Railway Signal Company deserve all the credit for pioneering with CTC, the installation made by Union Switch & Signal Company on June 30, 1928, was such a radical improvement that it is almost equally important in the history of railroading. US&S engineers developed a most ingenious method of centralized traffic control and persuaded the Pere Marquette to use it on a 20-mile stretch of single track between Flint and Saginaw, Mich.

The US&S method of CTC was important for two basic reasons:

1. The levers and indicators on the panel were so well arranged that their relative positions have become standard for all CTC machines.
2. All the control indications were sent out to the trackside signals and switch machines by codes so

Frank Kirby, Box N452 N. O. T. S. Inyokern, Calif.

that only two wires were needed to control all the wayside equipment. This saved a tremendous cost in wires, since the older method required a wire for each switch location on the line.

Here again Pere Marquette faced the need for a double track at a cost of $750,000. CTC at a cost of only $160,000 made double track unnecessary. Because men were needed at stations only for handling daytime business, five operators were transferred to other parts of the system where there were shortages of trained men. This line was not densely traveled. There were about 28 trains daily; but these trains came mostly between 6:00 p.m. and 1:00 a.m., and the bunching made train order dispatching quite a problem.

Pere Marquette is now an integral part of the Chesapeake & Ohio. The former PM lines now use CTC in several places, and the C&O proper is also installing many miles of controlled track.

On many other railroads, trains tend to bunch up with train order operation. It happens about the same as on a bus line at rush hour. By the time trains passing through a division reach the yard at the far end, they are too close together and the yard becomes choked. A CTC dispatcher can keep trains spaced apart because he can hold them back at any controlled signal when necessary.

Everywhere CTC has been used, it has paid out. Nickel Plate reports a saving of 43 per cent on original cost in one year. Other railroads save from 10 to around 70 per cent a year on their investment. Naturally the savings are greatest when CTC is used judiciously at points where traffic handling is the most difficult. CTC equipment is manufactured by both GRS and US&S, and both can supply almost identical components.

Let's look at the CTC equipment at one end of a siding. Everything is related to the power-operated switch where the side track leaves the main. A low voltage motor like the one on page 27 operates this switch in response to controls from the dispatcher's desk. This is called a "dual control" switch because the dispatcher can give his control of the switch over to the brakeman of a freight for local switching moves. If we want to throw the switch by hand, we must first get permission by phone from the dispatcher, then unlock the transfer lever on the side of the motor case. The other lever on the case will then throw the points just like any hand-operated switch.

On some railroads, hand-operated switches are used exclusively as an economy measure. This takes away some of the advantage of ordinary CTC, but all delays due to using train orders are still eliminated. The picture on page 16 and the drawing on page 20 show the CTC equipment at one "station."

Over there in that 8 x 10 foot steel shed are the batteries to power the switch and signals. The shed also houses a telephone and more than 50 relays that control the switch and signals and send back indications to the dispatcher's board. The phone control and indication messages are handled on only two wires for all the stations on a line of 40

to 100 miles. The relays in this shed sort out the code messages and take action only on messages intended for this particular switch and signal location.

Sometimes another pair of wires is added to bring power to the switch and signals. This lengthens the life of the batteries, but batteries are always kept on hand as standbys that cut in automatically in case the power line fails. A light on the dispatcher's board automatically indicates any power line failure.

When a train approaches a controlled siding, it is faced by two signals on the same mast. If the upper one is cleared, the train may continue on the main line past the switch. The lower signal clears to direct the train into the side track.

For trains leaving the station on the main track, there is another signal, while a fourth signal (sometimes a dwarf) instructs trains when to leave from the passing track.

These four signals are controlled by a single lever on the dispatcher's desk. This is the lower lever in the diagram on page 21. Normally the lever is in the center position so all signals display stop. The dispatcher moves the lever to one side to clear a signal for eastbound movements, or the other way for westbound movements. The position of the track switch determines which of the two eastbound or westbound signals is cleared in either case. Since the track switch is controlled by the upper lever on the control panel, the two levers on the panel determine which of the four signals at a station is cleared. By older methods of interlocking, this requires five control levers.

The wiring connections in the relay house prevent the signals and switch from operating in any unsafe combination. The switch is also automatically locked when a train is passing over it, and the signals change to stop automatically, the same as ordinary block signals when trains go by.

The track immediately around the switch is called an "OS" track circuit. OS is an old bit of railroad shorthand that means "on the sheet," or "out of station," depending on who you ask about it. Whenever a train passes over this part of the track in either direction, a permanent record is automatically made in ink at the central office.

Long No. 15 or No. 20 switches are often put at each end of a controlled siding. These will allow the engineer to pull his train off the main track at speeds well above 20 miles per hour. Sometimes the side track is made two

W. R. Davis, dispatcher for the Union Pacific at Las Vegas, throws lever 167 to reverse the east switch at Harvard.

or more train-lengths long so that the train may continue moving for a running meet, or do its stopping clear of the main track.

When a good many meets are to be made between two trains going in the same direction, sidings are made at least four times as long as the train. These meets are called "passes." They are almost impossible to handle by ordinary printed schedule since a minute or two delay for either train may change the desired meeting point by many miles. A pass is just about to occur in the right-hand side of the lowest diagram on page 24.

Some new signal aspects that give more specific information to the engineer are coming into use in CTC territory. These help to move trains where there are sidings of different lengths. On the Waynoka-Canadian part of the Santa Fe, a number of sidings are arranged with block signals in the middle so two trains can pull into the same siding. (See table on this page.)

At the end of double track, the signals and switch are arranged the same as at a siding. When CTC is used on double track, crossovers are located every 10 miles or so in order that slow trains can take the wrong main to let faster trains go by. The controls for crossovers are virtually the same as for the end of a siding, except that the switch lever in the central office controls both switches of a crossover simultaneously.

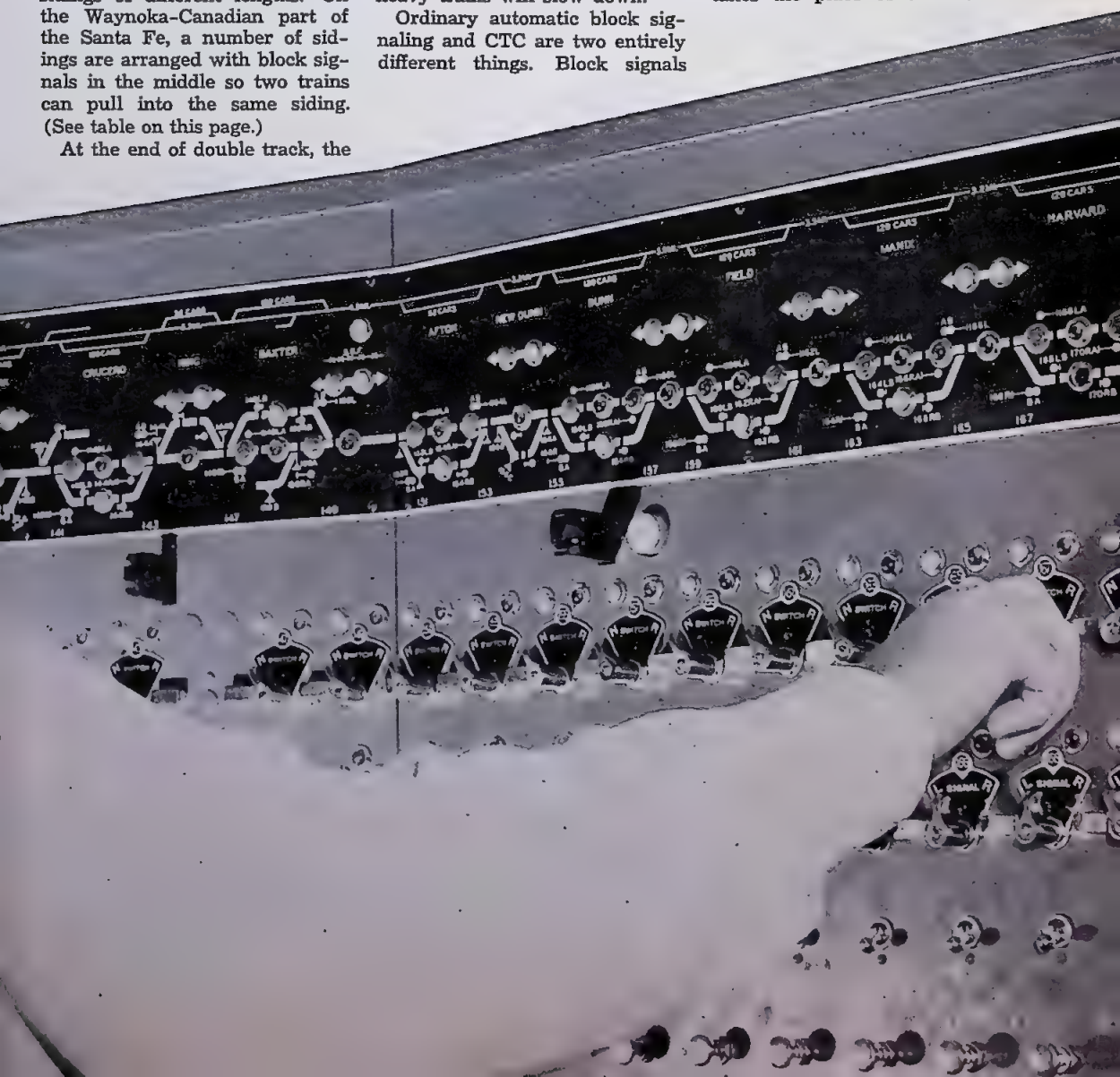
Between controlled sidings regular block signals are usually already in place. Often light type signals are purchased to replace the older semaphores. In keeping with higher speed operation, the block signals are also moved farther apart. Two miles is becoming an average distance, with closer spacing on grades where heavy trains will slow down.

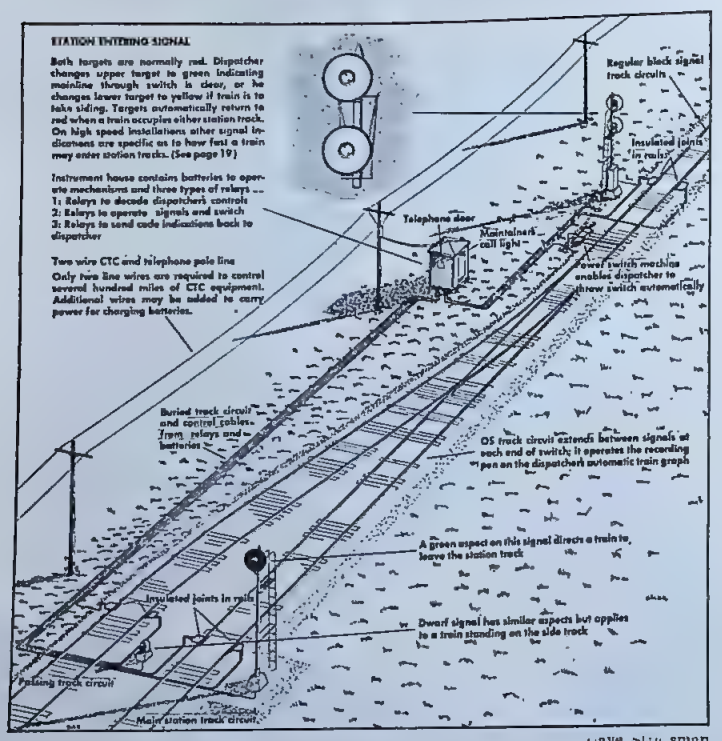
Ordinary automatic block signaling and CTC are two entirely different things. Block signals

ASPECT	NAME	INDICATION
G	Clear signal	Proceed
Y Y	Advance signal	Proceed Approach next signal at medium speed
R G	Medium clear signal	Proceed at medium speed
Y	Approach signal	Proceed preparing to stop at next signal *
Flashing R Y	Medium approach signal	Proceed at medium speed preparing to stop at next signal
R Y	Restricting signal	Proceed at restricted speed
Number plate R	Stop and proceed signal	Stop Then proceed in accordance with rule 509
R	Stop signal	Stop

* Train exceeding medium speed must at once reduce to that speed

merely help to space trains running in the same direction. CTC directs the movement of trains in and out of passing tracks, at junctions, at the end of double track, or at crossovers. CTC takes the place of train orders





Dave Strassman.

Two dispatchers can operate a machine↓ when traffic is sufficiently heavy. During light periods a single dispatcher could handle all the levers. This is the board at Las Vegas on the Union Pacific shown close up on page 19. Under the papers on the desk is the automatic train graph that records all trains.

and train superiority. While an ordinary train still must not run ahead of its printed schedule, the extra train enjoys the opportunity of going ahead as quickly as the dispatcher will let it in CTC territory. That's why Santa Fe's No. 5035-E was able to outrun the *Scout* on March 2. The same kind of thing happens every day in all CTC territories.

Spur switches and emergency passing tracks not controlled by the dispatcher are electrically locked to prevent their points from being thrown in the path of an oncoming train. When the conductor of a local wants to use the switch, he phones the dispatcher for permission to unlock it. The dispatcher gives the conductor a specified time to do his work, and then hangs a tag on the levers on the control board to show that *that* part of the main line is in use. Since there are no track circuits on many spurs, the board lights may not show that the local is working there.

A modern CTC machine is a very neat combination desk and vertical control panel. The top is about shoulder height from the floor, and the machine is usually painted dark green. When the

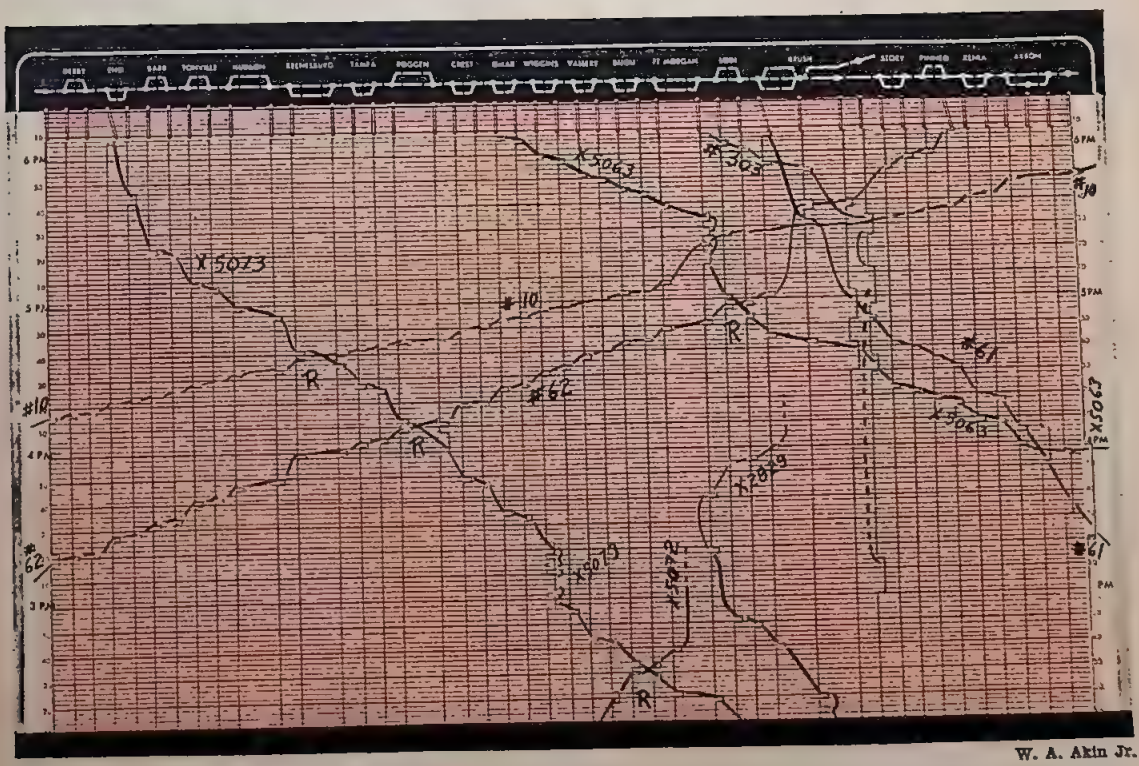
Union Pacific.

machine has a good many levers, its ends are bent forward so the dispatcher sits in a sort of horseshoe. Sometimes two of these horseshoes are arranged to face each other. When traffic is very light, one dispatcher can operate both machines. With heavy traffic two men sit at each of the two machines. At Amarillo, the Santa Fe has another small CTC machine on rollers so that it can be wheeled up to the horseshoes or moved away. Thus, one to five men will be able to operate the 250 miles of CTC lines in the area when the newest CTC project there is finished.

On the vertical panel facing the operator are all the levers, lights, and buttons the dispatcher uses to run the railroad. See page 19. Above them is the track diagram with more lights to show where trains are located in his territory. Under the glass on the horizontal shelf is an automatic train graph with pens which show in ink the entire record of the day's movements on the line. The back of the machine opens up so that maintainers can make periodic tests. See page 23. At other times, the back is locked.

A CTC machine is almost invariably placed in a fireproof

The signals and switch at each station are controlled by a single vertical row of levers and buttons on the central control board↗. Lights indicating track and signal conditions are also confined to the vertical slice of the panel. Automatic train graph↓ records all trains with ink. Paper moves 3 inches an hour.



W. A. Akin Jr.

Union Pacific.

Each relay house in the field has a telephone. The freight conductor is calling the dispatcher on Union Pacific's line in Oregon. Inside, a signal maintainer adjusts one of the relays that time the duration of code impulses.

building. If a stone or brick station is not already available, a small building is built for the dispatcher's office.

The CTC desk at Aurora, Ill., on the Burlington, was installed by GRS last fall. It represents much of the up-to-date thinking of CTC designers. Bill Akin, art editor for TRAINS, and I visited the Aurora office during the season of the spring floods early this year. While we watched dispatcher L. A. Howard operate the machine, night chief dispatcher M. F. Schwamberger explained the lights and levers. These are arranged very neatly in horizontal and vertical rows on the panel above the desk.

"Each vertical row operates one end of a controlled siding," said Schwamberger. The most conspicuous things in each row are the two levers about one inch long that can swing left or right.

"The upper lever operates the switch. It is always kept to the left or normal position except when a train is to enter or leave the siding. The white and red lights just above the lever show which way the switch is actually thrown regardless of the position of this lever.

"The lower lever is normally in the center position. I can clear signals for eastward or westward movement by throwing it to the left or right.

"The lights above the signal lever show the actual conditions regardless of the lever position. For an eastward movement, it is the light to the left that becomes green when signals are cleared. This is because the dispatcher faces south to operate this board. On many boards he may face north, so east would then be to to the right.

"I can move any lever but nothing will happen until I push this button near the bottom of the row. Since these levers can be set in advance, Mr. Howard can plan his moves at any convenient time and push the button later."

Just then, dispatcher Howard got word over the phone line that the *Twin Cities Zephyr* was having motor trouble and would be a few minutes late out of Savanna at the other end of the line. He already had set the switches at Burke, first siding this side of Savanna, so an extra freight could get off the main there for the *Zephyr*. The freight was still 10 miles away from Burke, but Howard knew he had time to get it into Savanna before the *Zephyr* entered his subdivision. He turned the switch lever back to the normal position at the east end of Burke, threw all the signal levers for a westward movement, and pushed the buttons. Immediately relays were heard clicking quietly in the control machine. A moment later more clicking came and the lights changed, showing that the switch exactly 100 miles away had been thrown to normal and that all the westbound signals were cleared.

"The first clicking you heard was the sound of the relays sending a control to Burke," Schwamberger explained. "We call all the outgoing codes 'controls,' and the codes coming back are 'indications.' The second series of clicks were the indications."

Above the levers is a diagram of the tracks with red lights set in it to show where trains are located. It is a sort of automatic map which keeps itself correct up to the minute.

The red light representing the extra freight kept moving in jumps to the right toward Burke and Savanna. Each time just before the light moved, there was a series of indication clicks. For a moment, two lights would be on as the train passed from one section to the next. The light for each OS section is right above the row of levers it represents. Other lights on the diagram showed when trains were on the main track at a passing siding, or on the main track between sidings. Trains on the side tracks did not display lights on this board because there were no track circuits on the sidings. Some CTC boards do have lights for the sidings as well, and white lights with arrows are sometimes used to show the direction trains are running between sidings. These can be seen above the track diagram in the photo on page 19.

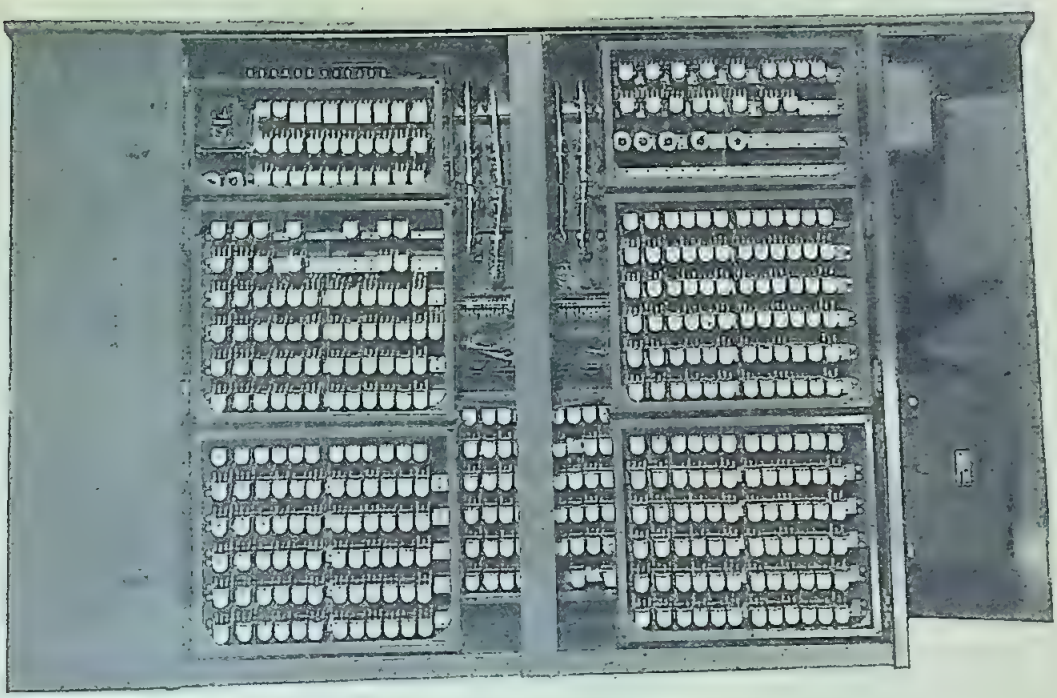
Above the diagram is another track plan without any lights. This shows the line in more detail. Some spurs and emergency passing tracks are indicated and the drawing is more nearly to scale. Notations show the car capacity of each siding. Burke and several other sidings hold 140 cars each. Shabbona holds 215 cars and Oregon only 76. The distances between sidings are also shown to help dispatchers judge the speed of trains.

A toggle below the levers can be thrown to light a maintainer's light on the relay shed at a station. With it the dispatcher can get help on the line if any detail needs attention. Another toggle above the levers can be thrown to ring a bell when any particular OS section is occupied. This is used to call the dispatcher's attention when he is busy at other work.

"What happens if you do something you shouldn't, Mr. Howard?" I asked.

"It's pretty hard to fool this machine. I'll show you."

Howard picked a part of the line where no trains were running at the time and threw the levers to clear signals into a



Relays are on racks which swing out so all parts of the control panel can be reached. Union Switch & Signal Co.

piece of single track from both ends at the same time. He pushed the buttons and the usual clicks went out on the line. Pretty soon more clicks came back and a horn started blowing a sort of intermittent raspberry.

"You see," continued Howard, "the signals are interlocked on the location. It is impossible to clear them for a conflicting move, and the horn tells me my controls cannot be carried out.

"If I try to throw a switch in front of a train, other devices protect the engine from running into a siding at mainline speed. The only way I can change a switch in front of a train is to set the signal against the train. Automatic timers at the station make me wait four minutes. Then I can move the switch. The four minutes give the train a chance to stop if it is started; but if the train is still close to the switch at the end of four minutes, the switch will not change anyway."

This feature of interlocking the switches and signals at the location makes CTC equipment distinctively different from the older types of interlocking where mechanical levers or electric contacts in the control machine are used for protection.

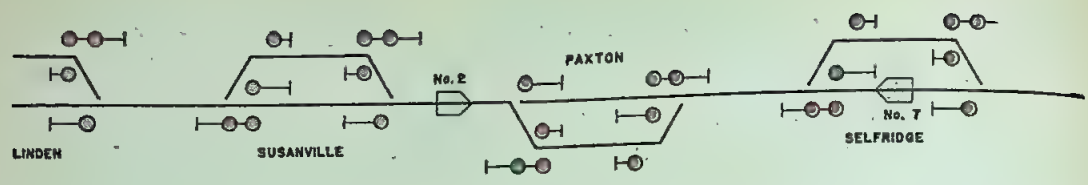
Howard keeps the signal levers set for the direction of traffic for several sidings ahead of every train. As the train proceeds, he pushes the buttons below the already prepared levers for about two sidings ahead. When two trains come toward each other, the levers are set for a planned meet; but the buttons are not pushed until later, as either train might be delayed and the desirable place for a meet would be changed.

We were surprised how much the telephone was used while Howard was dispatching. Even though train orders are used only to give slow orders where track conditions are temporarily restrictive, a lot of business still is handled by phone. There was a local working at Oregon and another at Big Rock. The conductors of these trains had to keep in frequent touch with Howard to make sure they had time to do their switching.

At that time, much of the Burlington main line was under water in southern Iowa. All trains from west of Omaha were routed over the Milwaukee Road to Savanna and then either over this CTC line or another longer route to the south into Aurora and Chicago. This extra traffic, in addition to the regular quota of Twin Cities trains and the *Empire Builder* and *North Coast Limited*, kept the Aurora and Savanna line unusually busy. It was running over 30 trains a day. A stock train moving eastward was getting close to the 16-hour limit for train crews as it neared Aurora. There were a lot of phone calls in and out to see if it could beat its time. It finally just made it. California trains were coming in many hours from their scheduled time.

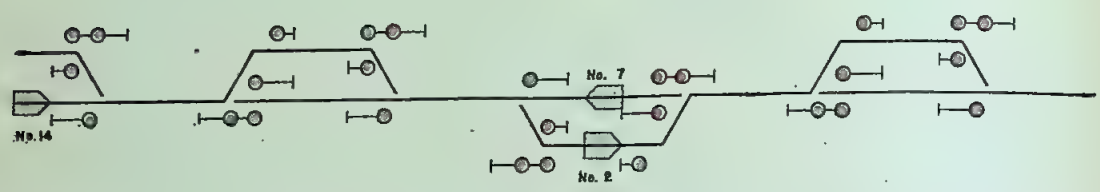
Other phone calls were made to and from agents at Flag Center and Rochelle. Between these points the line is double track, and the Milwaukee Road has trackage rights for its freight trains that run south toward the southern Illinois coal field connections. Each of these Milwaukee trains has to be reported and Howard marks them on his train sheet.

Most CTC dispatchers do not



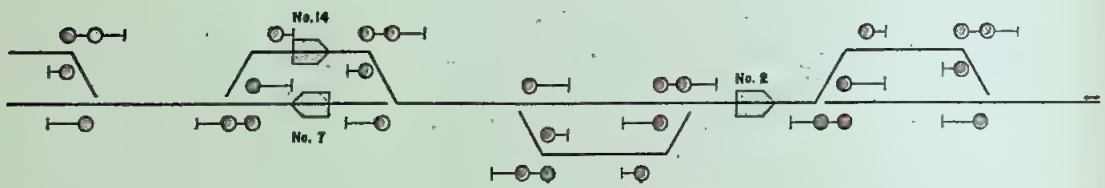
8:31

These diagrams show some of the operations that a dispatcher with CTC equipment can easily manage. On this page track conditions are shown. On the opposite page the corresponding indications show how the dispatcher gets his information in red lights on the track diagram. The dispatcher has set the levers for a meet at Paxton. The signal facing train No. 2 shows red over green. In actual practice this is often a red over yellow indication but the principle is the same. When No. 2 reaches the signal its crew knows that the switch is set for the siding and that a meet is planned.



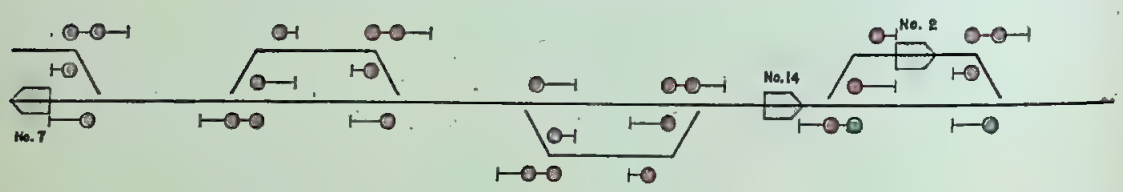
8:41

When both trains are at Paxton the dispatcher reverses the levers for the switches and clears the signals so both trains can continue. If train orders were in use instead of CTC, this stage of the operations would probably be reached at about 8:48. Another train, No. 14, appears at the left end of the board so levers are set for another meet at Susanville. No. 14 is making good time while No. 2 is running late with a crippled motor. The dispatcher knows that No. 2 will have to take siding to let No. 14 by, probably at Selfridge. Indication 12 stays red until button is pushed.



8:50

The meet at Susanville is made without stopping either train. Such "running meets" save many minutes of time. The dispatcher again flips the levers to let the trains through, and also clears part of the route for No. 14 to Selfridge, where he is now sure he will hold No. 2. Between sidings most railroads have additional automatic block signals. These do not show on the control panel as they have no effect on CTC operations. They merely let trains proceed from one siding to the next in spaced safety. Lights on the panel do show whether the train is near or far from a siding.



9:01

No. 14 has all but overtaken the crippled train, and a pass will occur in a minute or so. Signals can be cleared on the panel and on the line by moving the corresponding lever and pushing the button below. After a train passes, the signals change to red and stay red, at least until the button is pushed again. This is why some signals show red on these diagrams even though the lever is still in one of the clear positions. Since the dispatcher may control as many as thirty sidings, a large number of trains may be working in both directions in the territory at the same time.

W. A. Akin Jr.

have to keep a train sheet. When all their territory is CTC (Howard's has branches operated by train order), they depend entirely on the automatic graph.

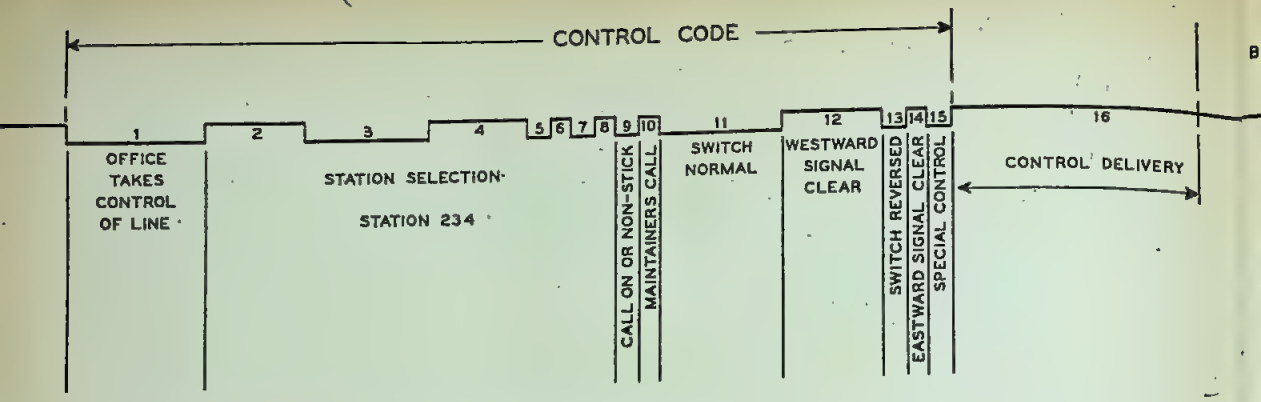
Schwamberger pointed out the features of the graph which is mounted under a glass window in the center of the desk. A similar graph taken from another Burlington division between Derby and Akron, Colorado, is shown on page 21.

"The paper travels at a rate of three inches an hour. Each horizontal line represents two minutes. The vertical green lines are drawn by pens, one for each OS section on the line. When a train travels down the track, each pen deflects to one side when its OS section is crossed. After a train has passed several stations, Mr. Howard lifts the hinged window and connects the OS marks with a diagonal line. Where two lines cross, the trains have made a meet or pass."

This record of train movements is very accurate. Howard marks the train numbers at the margins of the paper where the diagonal lines enter or leave. At the end of the day, the sheet is torn off the continuous roll and a heading sheet is pasted on. This is filed as a permanent record. During the day if the dispatcher has to leave his work for a few minutes, a glance at this sheet when he comes back will show exactly what has happened while he was gone.

The latest improvement in automatic train graphs gives even more information. As soon as a dispatcher clears a signal, the OS pen will move to one side or the other to show which way the switch is thrown. Later when the train arrives, the pen swings to the opposite side and finally returns to the center. This gives posterity a check on what the dispatcher was thinking about as well as how the trains ran.

Bill Akin and I spent too much time watching the *Zephyr* make up its lost time on the CTC board, and we had only a few minutes left to talk to Y. D. Shepherd, Burlington signal maintainer. Mr. Shepherd did give me a good start and a set of blue prints showing the wiring diagram of a CTC field unit. It took me more



Normally electricity flows along CTC wires to all trackside stations. When a code is sent out the current is interrupted for long and short periods, separated by long and short normal periods. The high parts of this↑ castellated line represent normal periods. To call station 234, periods 2, 3, and 4 are made long. Short periods merely mark time. Other long periods tell equipment what to do. An indication code coming back↗ works the same way. Codes vary to suit conditions.

than 16 hours of study at home to figure the whole thing out. The wiring is much more complex than ordinary radio circuits and about equals the complication of a small cross-bar telephone exchange. All of this makes it possible to control as many as 128 switch motors, 512 signals, 128 signal maintainers' lights, 896 indications, and any number of telephones with the same two wires.

The principle of coded CTC depends on the sending out of long and short electric impulses on the two wires. It works something like a rural party-line telephone when you ring up your girl friend. Perhaps Sadie's number is two long, two short, one long. By the time Sadie answers the phone, everyone else in Haskell County is listening too. It's the same way with a CTC code—all the CTC equipment is "listening," but only the right equipment takes action. Fortunately the dispatcher doesn't have to know anything about the codes he uses. He just throws a desired lever, pushes a button, and the machine beats out the right code automatically. In fact all a CTC machine does is translate lever motion into control codes and returning indications into light patterns on the diagram. It's the fanciest telegraph key invented.

Above this column is a picture of a code. Ordinarily the electric current is on the wire all the time. When a code is sent, the current is short-circuited for either short or long periods. These are called short and long odd impulses and numbered 1, 3, 5, 7, etc., depending on how late in the code they come. In between the short-circuit periods the line is re-energized for either short or long periods. These are called "even impulses," 2, 4, 6, etc. Except for impulse 1, all the short impulses are about a tenth of a second long and the long ones a quarter of a second. Impulse 1 is a little longer than an ordinary long impulse if the code is a control from central; it is a little longer than a short impulse if the message is a field indication.

The picture shows how a control for station 234 is made up with impulses 2, 3, and 4 long, and the others short. All the stations are "listening" to this code as it comes from the central board, but they drop out as soon as any part of the code does not fit them. For instance, station 2347 would stay in until impulse 7 comes along. The picture shows impulse 7 is short, so 2347 will drop out at that time; 234 is still listening, but a 2348 would drop out on the next short impulse. It is the long impulses that do all the directing of the equipment.

After the desired equipment is properly called by number, further impulses tell it what to do. As before, it is the long impulses that do the directing.

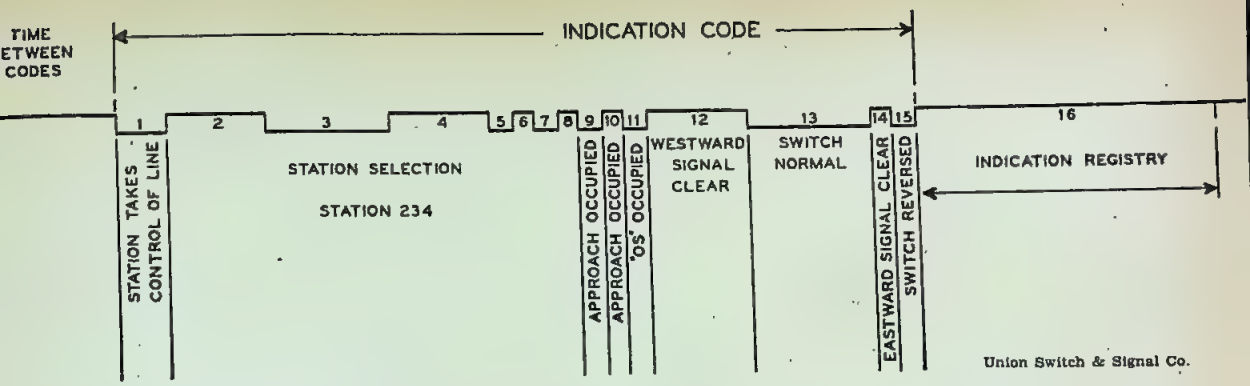
Whenever conditions change on the line, the field unit sends a code back to headquarters with the latest information. Since a control always produces a change, it is always followed by an indication. That is how the lights on the panel can tell the dispatcher that his order has been fulfilled. The indication that usually answers the control on this page is on page 27.

Relays do all the work of coding and decoding in CTC equipment. A relay is a coil that is wrapped around an iron core with a loose piece of iron hinged to it. When an electrical impulse goes through the coil, the loose armature becomes a magnet and operates electric contacts which change the connections to other apparatus. A relay can control a signal, a motor, or other relays.

The equipment distinguishes between long and short impulses by having two quick and two sluggish relays follow the code. The sluggish relays are too slow to be operated by the short impulses, so they cancel the effect of any but the long impulses. The quick relays operate another group of relays that count all the pulses as they come. In this way, for example, the mechanism can tell when pulses 11 and 13 come along whether they are short or long and thus whether to throw a switch or leave it normal.

Another device in the equipment prevents any station from using the line while another code is going over it. This prevents messages from getting mixed up and becoming senseless.

Controls and indications take about four seconds each, so there is a limit to the number that can be used on a line with moderately prompt action. For this reason a large CTC territory is divided into several smaller districts. Any districts near to the control machine are operated by direct wire. Beyond a distance of 40 miles or more the impulses are sent out by what is called "coded-carrier CTC." All this means is that the impulses are sent by radio-like waves guided along the same two wires that do the ordinary CTC work. At the remote district, a receiving set



Union Switch & Signal Co.

changes the "carrier waves" into ordinary CTC impulses.

The Waynoka line on the Santa Fe is a fine example of carrier-coded CTC. All the impulses for the four districts on this line go by low frequency waves from Amarillo to Pampa. Here they are boosted in strength and sent on to Canadian at the beginning of the first district. The impulses for the first district are converted to ordinary CTC codes while the other carrier impulses are converted further along the line at Coburn, Shattuck, and Woodward. The returning indications go back to Amarillo in much the same way.

Carrier waves behave themselves and always stay on the two guiding wires. Even if they were to jump out into space like radio waves, you could not receive them on an ordinary set, for they come way below the low end of the dial. The four control channels are from 18.3 to 21.6 kilocycles and the indication channels are from 11.7 to 13.7.

On the Norfolk & Western's Shenandoah Valley branch, carrier-coded CTC eliminated enough line wires to save 108,940 pounds of copper. This was during the war when conductive materials were so critically needed.

The war made its mark on CTC and CTC did its part to help in the war. Many more miles of track were put under control each war year than ever before. In several cases emergency conditions were normalized by CTC. Take for example the Santa Fe's branch from Los Angeles to San Diego. In ordinary times several trains a day made the leisurely run down the rugged coast line.

As soon as war broke out, the Navy yard began to operate at full speed. Airplane factories and the increased population of San Diego contributed more traffic to the railroad. In a short time traffic was tripled. A double track seemed best but would require critical material and labor. Two tracks also would become a white elephant when the war was over. CTC was of course the remedy.

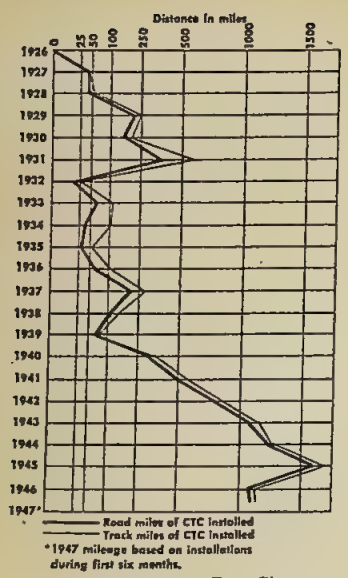
Two dispatchers now control the line easily. Before CTC, trains had often waited in the yard while track was available for miles of free running on the main line. It was just impossible for the dispatcher to keep up with all the train orders for the special movements, so some trains just had to wait.

N&W's Shenandoah line had six times the normal traffic. Much of the coal that formerly went by boat from Norfolk to New York or Boston had to go all the way by rail. Only after CTC was installed could the single-track Shenandoah line dispatchers keep all trains moving.

Union Pacific found CTC a great help in moving war supplies and troop trains from Las Vegas to Daggett in the desert. The installation saved from three to six hours for each train running over the line. The carload capacity of the line was doubled. This project was so successful

Union Pacific.

Dual control switch machine.



Dave Strassman.

CTC was relatively little used until wartime traffic demanded it. Annual postwar orders are still good. Map shows all CTC over 10 miles long in black.

that another CTC was immediately installed between Las Vegas and Caliente. Today a third link is under way which will put the old Los Angeles & Salt Lake route under continuous CTC for more than 400 miles from Milford, Utah, to Daggett.

Other long CTC territories are in use on the Oregon lines of the Union Pacific. One over the Blue Mountains between Pendleton and La Grande is particularly helpful in getting the pusher engines down off the summit when they are through working. Previously several extra engines had to be kept around because of the difficulty the dispatchers had in getting the pushers home.

Missouri Pacific is so well sold on CTC that its timetable maps show a double line for CTC track the same as for double track. This road is another pioneer in the field and uses a considerable mileage of controlled track. A freight from St. Louis can travel on ordinary double track and single track with CTC all the way to Texarkana and Longview, more than 600 miles, with only 25 miles of the route under train order operation. Freight trains run 20 miles per hour including stops on this line. They used to run 13 miles per hour.

Back in 1925 a very ingenious plan was developed by the road's signal engineer, B. H. Mann, to speed up traffic on the line between Kansas City and Osawatomie. It was a step toward CTC, for all the trains were controlled by signals. But the dispatcher had to instruct his nine operators at wayside stations to set the signals. As in CTC the signals were interlocked out on the line.

On many roads consideration is given to the poor fellow on the motor car who has to jump fast if he suddenly finds himself headed toward an oncoming train. On the Louisville & Nashville, special lunar white signal lamps are lighted when no train is expected. A section man can proceed with courage with this kind of information. L&N operates large CTC territories in Kentucky, Tennessee and Alabama.

If the NYC and the Pere Marquette made history in 1927 and 1928, certainly the first installation of a complete subdivision operated by CTC should also be in the hall of railroad fame. This was the Burlington's project between Derby Yard in Denver and Akron, Colorado, in 1937, just 10 years ago and 10 years after the first CTC. It was installed with US&S equipment. The dispatchers who operated this board soon became proud of their running meets and nicknamed them "mallards." In 40 days they made 168 mallards. It is interesting that on this line during the sugar beet season, a number of spur lines are put into use. During the rest of the year, the switches from the main line to the spur tracks are ripped up and put aside until the next season.

The Burlington is one of the biggest users of CTC. Trains for California now run on either multiple track or CTC all the way from Chicago to Denver. Between Lincoln and Denver, CTC is used for 480 miles, the present record for continuous operation over controlled track. The *Exposition Flyer* and other trains continue beyond Denver on the Denver & Rio Grande with CTC most of the way to Helper, Utah, and then double track and more CTC to Salt Lake. Even on the Western Pacific end of the route CTC is used and a new installation is in progress. The Burlington's record will be surpassed by the Seaboard Air Lines, which will complete 600 miles of CTC all the way from Richmond to Florida in another couple of years.

Before 1937 only short pieces of track had been equipped with CTC. Often these were little more than remote-controlled interlockings for switches a few miles away from a tower. The Burlington's Derby-Akron installation started a wave of bigger CTC projects, and the war convinced railroad men of CTC's usefulness.

Today more than 7,500 miles of road are operated by CTC. The cost of from $8,000 to $20,000 per mile, depending on the number of sidings, is often being paid off in the first five years of use. Compared with double track, single track with CTC is about equal to 1½ tracks and not as expensive. In time to come, most main lines of the country will be protected and traffic speeded by Centralized Traffic Control.

Linn H. Westcott.

PHOTO SECTION

Thomas P. Donahue, 6 Pine St., Waterbury, Conn

Baltimore & Ohio's westbound Metropolitan Special enters the interlocking at McKenzie Tower west of Cumberland, Md. This is the West End junction of the Patterson Creek cutoff (tracks in foreground). The westbound track from the cutoff is signaled for high speed through the interlocking; the Metropolitan Special is entering a medium-speed route. Soon Pacific 5094 will get a helper to go up Seventeen Mile Grade on the Cumberland Division to Grafton, W. Va.

R. P. Morris, 214 Gelston Ave., Brooklyn 9, N. Y.

Locomotives 105 and 107, staunch little Consolidations (2-8-0), climb westward at Keezletown, Va., on the Chesapeake Western. This short line runs 21 miles west from Elkton to Harrisonburg, then branches. One leg drops almost due south to Staunton, 25 miles from Harrisonburg, and the other angles southwestward to Bridgewater, 8 miles from Harrisonburg. Two daily passenger trains run through from Elkton to Bridgewater and return, with schedules arranged to connect with two Norfolk & Western trains at Elkton and (without too long a wait) with the Southern Railway at Harrisonburg.

P. H. Howard, 51 de Breslay Ave., Pointe Claire, Que., Canada.

Canadian National's engine No. 6404, a 4-8-4, is silhouetted against Toronto's night sky.

The Long Island Railroad is primarily a commuter road, but it also is a terminal railroad for freight operations. This pusher engine is helping an eastbound freight between Long Island City and Fresh Pond Junction.

John B. Reschke, 690 8th Ave., New York, N. Y.

Locomotives of the Long Island Railroad are serviced in this 22-stall roundhouse in the Morris Park Yard in Queens County.

Ewing Galloway, 420 Lexington Ave., New York 17, N. Y.

Norval P. Barksdale, Lincoln University, Jefferson City, Mo.

Robert McKell, 200 W. 2nd St., Chillicothe, O.

The PLM (de Paris a Lyon et a la Mediterranee) is known to many travelers as "the New York Central of France." It runs through the rich Rhone Valley to the Riviera and the Mediterranean cities of Marseilles, Nice, Cannes and Monaco. A 4-8-2 waits← in the station at Dijon, France. Rails are bolted to crossties, not spiked.

A Japanese locomotive pushes four-wheel freight cars over the hump↑ in yards west of Kawasaki, just south of Tokyo. Gauge of the railroad is 3 feet 6 inches. A special train↓ for dependents of U. S. Army personnel leaves Central Pier, Yokohama, for southern Japan. The Americans have just arrived in Yokohama by ship. Coaches and Pullmans carry the stripe which marks first class cars now used for Allied personnel. The Japanese were slow to appreciate the advantages of rapid transportation, and until a rice famine in 1869, they had no thought for railways. That year, however, people in the south died of hunger while northern provinces had a bumper rice crop. The first railroad was opened in 1872.

Robert McKell.

Courtesy New Haven.

The New York, New Haven & Hartford Railroad is a big user of diesel locomotives as well as steam and electric engines. The first of an order for 15 new 4500-horsepower freight diesels↑ was received recently. It was built by Alco-G. E. in Schenectady, and will be used between New Haven, Conn., and Maybrook, N. Y., as will its sisters. The new diesels can haul 4000-ton trains at 65 miles an hour and will eliminate the use of pushers up the heavy grade at Hopewell, N. Y. New Haven now has 250 diesels.

Kent W. Cochrane, 104 Camp St., New Britain, Conn.

The New Haven's Bridgeport wire train← is shown at Danbury, Conn., where electric operation ends on the route from New York City to Pittsfield, Mass. First car behind the locomotive is a supply car; it is followed by a wire car whose collapsible platform allows maintenance men to work on the wires. The third car houses equipment and is followed by another wire car. The first caboose is for the transmission crew and the other is for the train crew. Crewmen eat their lunch in the cabooses but do not sleep in them, and the space ordinarily taken up by bunks is used to store electrical equipment and supplies.

March 23, 1946: Spring fever is in the air as NYC train 30 pulls into Harrington Park, N. J., on its morning southward run from Newburgh to Weehawken on the West Shore Route. This local makes 32 station stops in 58 miles.

James J. Speer; from Robert B. Adams.

Willard V. Anderson.

Grand Trunk Western's eastbound Maple Leaf↗ stands at the station in Lansing, Mich., while her head-end crew transfers mail, baggage and express. The General Motors Train of Tomorrow↖ rests on a siding behind the station. This photograph was taken when the GM train moved from Chicago to Detroit.

Jesse James and his gang of train robbers once held up a St. Louis & Iron Mountain train at this spot↗ near Otterville, Mo. The StL&IM is now part of the Missouri Pacific. Train is MoPac's eastbound Eagle.

Paul E. Nentwig, 302 N. Buchanan St., Jefferson City, Mo.

Westward Ho by Railcar

The CWRR&N delivers passengers, newspapers, milk, and gossip to redwood

The darling of Pacific Coast railfans is the California Western. It is probably the crookedest railroad of its class in the world. This standard gauge line starts near sea level at Fort Bragg, Calif., and climbs over a summit of 1740 feet to reach Willits. Here it interchanges cars with Northwestern Pacific and uses NWP's yard and station.

Throughout its 40-mile length the route twists and turns like a snake with a green-apple belly-ache. The longest straightaway is less than a mile, and wherever the rails lead, they climb either up or down. Between Shake City on the western slope, and Summit, an air-line distance of approximately 1½ miles, the line loops 8½ miles in bowknot turns, to climb 1180 feet. Curves, compound curves, and double compound curves follow one another without cessation up the 3 per cent grade. The mountainside is literally terraced with rails, the terraces crowding so closely that in two places the narrow right of way overlaps.

W. K. Dodge, civil engineer for the road, startles visitors and tests their credulity when he tells them, "If a trackwalker and a train start downhill from Summit, the train running at 25 m.p.h., and the man walking the straight line path, the trackman can very easily beat the train to the foot of the grade." Fred Hanson, transportation superintendent, offers as proof his own personal experience during the years he worked as conductor on the line. Many a time, when he was bored or thought he needed exercise, he would drop off the caboose, walk down the trail to the curve below and wait for his train there.

The beautiful NWP-CWR station at Willits is 140 miles from San Francisco. It is undoubtedly one of the finest examples of Tyrolean architecture in America. Behind it is a story of the pride of men in their work and homeland. Many a Willitsman will tell you about Paul Foster, owner of the Northwestern Lumber Company, who was a pioneer developer of this part of California. Foster's company, together with the Union Lumber Company and the Irvine & Muir Lumber Company, set aside its choicest redwood logs for a period of about one year. When enough was piled up, it was sawed and donated for the station with the only provision that the natural beauty of the redwood would never be concealed by paint. A good redwood man is insulted if you suggest painting the wonderful weather resisting wood, because nature has already built in its own preservatives.

Crowds gathered in 1916 for the opening of the new "Willits Union Station." One of the two main buildings is the station restaurant. For many years hundreds of hungry passengers were fed here when daily trains from north and south paused for the lunch hour.

Today the empty restaurant is a reminder of the shift of rail passengers to other means of transportation. NWP passenger trains now pass through in the middle of the night and even the attractive waiting room in the main station is little used.

The California Western is one of those few lucky little lines that has thus far escaped the full fate of many small roads, for where the CWP goes, good automobile roads do not. There is still a steady, and sometimes considerable, volume of passengers. They ride in gasoline or diesel cars, all affectionately referred to as "the Skunk" by patrons of the line. Summer schedules provide two trips a day each way to serve the crowded camps along the line. On occasion the little Skunk has been known to tote as many as 70 kids up to one of the big camps, and it's a dull run even on the one-a-day-each-way winter schedule when a passenger finds no companions.

Shortly before 7 a.m., we climb aboard the Skunk, technically the M-200. It's about the size of a standard street car and painted bright lemon yellow. Motorman John Galiani and Conductor Saunders pull out their watches. On the dot, Saunders says, "All right, John." Galiani reaches up and gives the bell rope a pull, puts the car in low gear, lets out the clutch and feeds the gas. The Skunk is away.

Out of Willits, which is 1364

Loading at Ft. Bragg. Jim Gayner, 327 Magnolia Ave., Piedmont, Calif.

BY SQUIRE KNOWLES

resorts.

feet above sea level, the roadbed begins to climb gently. Sitting up near Galiani, we can look ahead and soon we see the first of an endless series of curves. Grades get steeper and by now the Skunk is climbing in second gear and swinging along with a throaty rumble. The grade here is 3.3 per cent. That's like approaching the limit for steam motive power. It would be something to watch a freight blast up this grade, but Saunders says that all freight is hauled at night. Five miles out and 376 feet above Willits the Skunk hits Summit Tunnel and ducks into the 700-foot bore.

On the Willits side of the tunnel the mountains are rolling, brown and spotted with patches of forest. When the Skunk starts that 8½ mile descent of 3 per cent grade on the other side, we are in deep woods. Sometimes the Skunk seems to be slipping through a tunnel of greenery where ferns reach out to brush the side of the car. Then again the tracks ahead disappear so abruptly around a jagged wall of rock that you fear the bright yellow paint will be scraped off. There are times when the car slips along the edge of a rock wall, supported by a clinging trestle — places where your eye is on a level with the very tops of tall redwoods. Down and down the tracks drop. The Skunk, whipping around the curves, sways and swings her rear end like a hula dancer. One curve turns for 235 degrees before the track swings the other way. Thirty-one curves are 24 degrees (radius 240.5 feet).

Though the Skunk continues to roll us downhill almost to Fort Bragg, the heavy grade ends near Shake City. Just west of this point is the longest stretch of straight track. This is the best place to walk back for a drink of water if you are thirsty — and quick, because the curves will begin again soon. They follow one another endlessly, though not

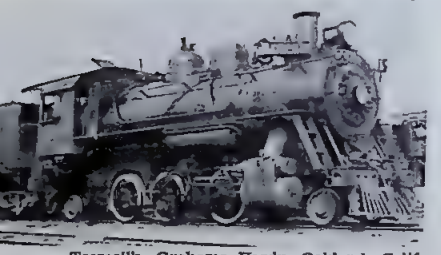
Redwood trees at Grove. Wonacott's Studio, 120 Laurel St., Ft. Bragg, Calif

Warren E. Miller, 306 Jerome Ave., Piedmont 10, Calif.

The Skunk emerges from a 700-foot tunnel 5 miles west of Willits. This is one of two bores on the 40-mile road.

A. J. Nelson, CWRR&N.

West of Summit the road abounds in loops and steep grades like this horseshoe. The majestic redwoods line the curved right of way everywhere and are a constant source of enjoyment to outlanders who visit the area to hunt or fish.



Tecrasilk, Grahame Hardy, Oakland, Calif.

The low-wheeled Prairie↑ is used only for freight. Rail car is on Bridge 51↓, one of many Noyo River spans.

Wonacott's Studio.

monotonously, for we see them disappear around rocky corners or into heavy forest in a way the reminds us of a sleight-of-hand performance.

Irmulco station, 24 miles from Fort Bragg, was the eastern terminus of the isolated road for many years. Farther west at mile 18 (from Fort Bragg) is Alpine. This place was well known in the early days when it was the train-stage transfer point for passengers before the road was laid over the mountain to Willits.

From here surveyors located the track along the Noyo River Canyon. When the railroad was completed in 1911, there were 110 bridges and trestles crossing and re-crossing the stream. With modern construction and earth-moving machinery to make the job easier, track men have eliminated almost half of these; the number is now about 60. Now in many places we can see abandoned grading that was used before the track was realigned.

The Skunk swings on down the river canyon, which gradually widens out and becomes less rugged. Soon after we pass through Tunnel 1, an 1100-foot bore which drives under a ridge to reach the banks of Pudding Creek. From here the Skunk climbs up out of the river bed to Fort Bragg. At precisely 9 a.m. it comes to a stop at the platform of the neat white building that is the station and general offices of the company. Adjacent to the tracks is the huge plant of the Union Lumber Company. Here lies the clue to the history of the California Western Railroad & Navigation Company and to this part of the Mendocino County.

In 1852, soon after gold was discovered in California, a ship bearing a valuable cargo from the Orient was wrecked near the mouth of the Noyo River, about a mile below Fort Bragg. San Francisco salvagers who sailed up the coast to retrieve what they could from the wrecked ship brought back tales of the magnificent redwood forests that stretched for miles along the rocky shores. Now at that time San Francisco had a housing shortage as acute as it has today. The timber stands in the Fort Bragg region looked inviting. Henry Meiggs, a colorful pioneer promoter, organized a company, had machinery shipped around the Horn, and set up the first saw mill at a point some 12 miles below Fort Bragg. (Meiggs later fled to South America to avoid arrest in connection with one of his promotions. In Peru he built the Ferrocarril Central.)

Other mills followed along the coast as the lumber business prospered. Operations were difficult because oxen had to be used to move the huge logs to stream or mill. By the late 1880's the need for railroads to tap timber stands farther from the mills became acute and a number of

Wonacott's Studio, Ft. Bragg, Calif.

James L. Gayner.

The Union Lumber Company built the California Western to serve its sawmill↑ at Fort Bragg. Union owns all CW stock. The Skunk→ enters North Spur; Conductor Joe Silvia is on the steps. The M-200 is the road's newest rail motor car.

short lines were built. It was about this time that the Union Lumber Company began operations. Its logging tracks pushed up the Noyo River canyon to reach the big timber stands there. Evidence of construction progress on the road and the logging out of the timber is recalled by stations still known as "Camp Three," "Camp Four," and "Camp Seven."

In those early days when the line was strictly a logging road, it must have been a constant source of interest to the citizens of Fort Bragg. Items concerning it appeared regularly in the local weekly newspaper, the *"Advocate."* For instance, on September 25, 1899 one item said: "Locomotive No. 1 has made several trips up Cannon Ball Gulch lately. Mrs. Fred Severance is the first lady to ride over this piece of road. She has good nerve." In another issue of the same year this appears: "A good joke is told on John Ketchum while out with a party last week up Pudding Creek on the Fort Bragg Railroad. He was so badly scared while the train was going over a rough piece of track that he fairly got down on his knees."

Passengers in the early days took their chances, but as the line pushed farther inland toward Willits, the possibilities of a first-class through service intrigued its owners. The NWP running up from San Francisco terminated at Willits in those days and there was good reason why such a through service should be established. The only other way that freight and people could move from this isolated coast to San Francisco was by ship. This was extremely hazardous. There were no real harbors; there were dense fogs, and all of the coast was rocky and reef-ridden. Wrecks were commonplace. Hundreds of lives were lost through the years.

It was in 1905 that the California Western Railroad & Navigation Company was incorporated to take over the Fort Bragg Railroad and extend the rails over the Coast Range hump to Willits. The Union Lumber Company, sole owner of the stock in the new company, also owned a fleet of passenger and freight ships at that time, and probably intended to include the management of these in the new corporation. That would account for the "Navigation" in the corporate title. But the ships were disposed of and the company confined its business to railroading.

Before it was finished, the railroad inaugurated a regular through passenger service. Passengers were carried to Alpine by rail, then transferred to stages connecting with the NWP at Sherwood. As the line extended, the stage travel was shortened. In 1909 automobile stages were used; this is probably one of the earliest examples of a scheduled service of this kind. The company, through advertising, also tried to attract automobile tourists. Mo-

Squire Knowles, San Francisco, Calif.

The California Western meets the Northwestern Pacific at Willits Union Station. M-200 stands at the left.

Wonacott's Studio.

Merrymakers leave Fort Bragg for a picnic at Eagles Nest along Noyo River. In other days an observation car catered to the tourist trade.

M-100 westbound at Irmuico. Jim Morley, 2635 Etna St., Berkeley, Calif.

torists who drive to the railhead could "have car put on train and brought to Fort Bragg on same train." It was an idea anticipating the identical service offered by major lines decades later.

In the meantime, the construction crews were at work grading the line to Willits. It was a slow and difficult job. Not until 1911 was the company ready to run the first train. On December 19 of that year, a complimentary excursion carried about 150 excited citizens from Fort Bragg to Willits. J. G. French, superintendent, was at the throttle of engine No. 5, which left Fort Bragg at 9:15 a.m. Ed Hendrickson relieved him at Alpine and made the rest of the run. F. L. Hanson, mentioned earlier, was the conductor. At 11:45 a.m. they arrived at Willits where, according to a newspaper account of the time, "whistles were blowing, bells were ringing, the band was playing, old men acted in playful moods like boys. . . The whole population was enthusiastic." Crews ran trains on a regular schedule the following spring.

Ed Hendrickson, engineer on the first train, is one of the pioneer railroad men of the Redwood Coast. He is now retired and lives at Fort Bragg. As a tow-headed boy of 10 he watched the men unload the first steam locomotive at Albion, some 30 miles south. Oxen pulled the engine off the lighter, and as the fireman waited for the boiler to fill with water, the engineer oiled the machine. In the course of this, he playfully poured some oil on the bare feet of the watching boy. That was Ed's baptism. "Just seven years later, I was fireman on that same engine," he'll tell you. At 18 he was the engineer. Later on he moved from the Albion lumber road up to the Fort Bragg railroad as engineer.

Every railroad has had its wrecks, and the California Western is no exception. All of the road's difficulties of this kind, however, have been minor — although Hendrickson tells of one occasion when, but for a keen sense of observation, his passenger run might have ended in a major catastrophe.

"Stormy weather had raised the Noyo River about 15 feet," Hendrickson says. "When you're going up and down the road regularly, you'll notice if so much as a leaf is turned. I noticed that a rail didn't look quite right on a curve we were approaching. I stopped the train and went ahead to look at it. Behind a blind corner I could see that bridge 20 was out. We'd all have gone over — engine and three cars — if I hadn't stopped."

Another time Hendrickson on engine No. 5 had no warning when the locomotive jumped the track on a curve near Alpine. Right in the path of the derailed locomotive was a house, and No. 5 went through the middle of it, timber flying in all directions. The house was unoccupied and fortunately, too, the engine remained upright. "Some noise we made," is his laconic observation. No. 5 was a rather notorious locomotive on the line. On another trip it took another crew through a bridge into the Noyo River.

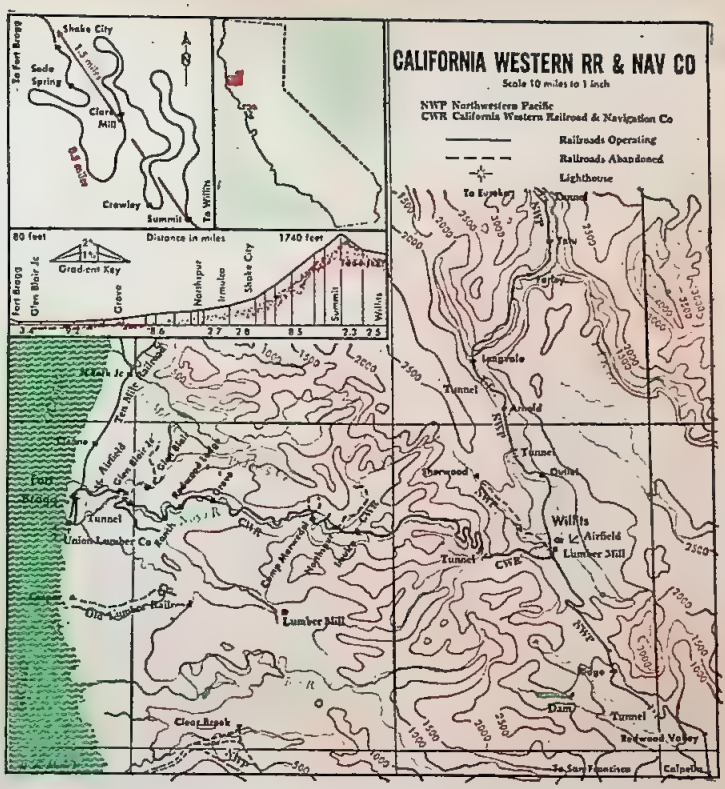
The California Western men endeavored to improve the road's passenger service as the years went by. An observation car became a regular feature, giving the patrons a better chance to enjoy the remarkable scenery.

The woods and hills have earned the road the reputation of being one of the most beautiful railroad routes in the world. A through Pullman service took night travelers all the way to San Francisco Bay in conjunction with the NWP. But in time when good highways were put through to the coast, bus lines began to serve the areas that had depended on the CWR, and passenger travel declined.

It was in the mid-20's that the first Skunk, the M-80, came to the road. It was one of the first motor rail cars ever built and the CWR bought it after it had toured a good part of the country as a demonstrator. Since it has been with the road, it has ticked off close to a half-million miles. Eventually, the railroad discontinued using steam locomotives for passenger service and added the M-100 and later the M-200. These were used equipment. We'll come back to the M-100, but first let's have a look at the road from the freight operation angle.

The California Western remains essentially a logging and lumber road, though in certain seasons canned peas and fish add revenue. The heavy grades and curves make freight a real problem for the owners. General Manager A. T. Nelson says that they have thought of using Shay locomotives but found it would be impractical. A locomotive of this geared type would knock itself out on the long stretches of minor grade. Mallet locomotives have been considered, too. The Casper, South Fork & Eastern, a small logging road which operates 6 miles south of Fort Bragg, uses them. Since the rise of the diesel, serious thought has been given this type of power, but no diesels have been acquired.

So now, as in the beginning, the road operates with the tried and true side rod steam equipment of standard design. Master Mechanic Bert Moe keeps the five locomotives in the pink of mechanical condition. He also oversees the repair of other equipment including two saddle tank locomotives owned in the name of the Union Lumber Company. The CWR, by the way, supervises the operation of a 20-mile logging road that runs north from Fort Bragg to Ten Mile River, turns into the river valley and



From the mouth of Russian River to Eureka along the California coast are, or were, a great number of lumber railroads. The lines usually extended from a mill or dock up into the redwood forests in the deep ravines to the east. The California Western was the only line to cross over the main ridge.

continues to the logging camps.

Three of the five locomotives, Nos. 21, 22, and 23, all Prairies, were purchased from the Baldwin Locomotive Works in the middle 20's. No. 41, a Consolidation, came from the Sierra Railroad, and 44, a Mikado, was purchased from the Lamb Lumber Company of Klamath Falls, Ore. This last, a locomotive of 12-ft. 6-in. rigid wheelbase, illustrates something of the motive power problem encountered on the road. "If she had been 12-ft. 10-in.," says Bert Moe, "we could never have got her in here." The problem, of course, is to get the maximum power on the shortest possible wheel base. The immediate result of an overly long driving wheel base on tight curves such as abound on the CWR, is spread rails.

On the freight hauls the practice is to run two separate trains out of Fort Bragg, each made up of eight cars and one locomotive. If the cars are heavily loaded, three or even four locomotives will go. There is no scale at Fort Bragg to weigh the cars, but the trainmen are expert guessers and seldom miss. If they do, it means an extra trip over the hump.

The second train is left standing at the foot of the grade while its locomotive helps push the first train over the hill. Once through Summit Tunnel, the locomotives leave the cars and drop back down the grade to pick up the second string of eight cars. The doubling of the hill accomplished, the two trains are joined and proceed into Willits. The eastbound trip takes about five hours. Westbound the grade is shorter, the curves fewer, and the major portion of cars are empty; consequently operation is simpler.

All freight operations are carried on during the night, and there is rarely any passing traffic. This simplifies dispatching and eliminates the danger of head-on collisions. There have been one

or two cases of runaway cars, but the curves of the road brought a quick end to their flight.

To round out the picture of the California Western, come on the mid-day ride back to Willits. It is on this run that you begin to feel the real character of the Skunk and to sense the unhurried air that pervades this beautiful country of deep forest, mountains and rocky coast.

On the Fort Bragg station platform a fairly good crowd is waiting for the Skunk: Boy Scouts and a scout master headed for camp, a couple of horny-handed ranchers, and a little girl going up to spend the week-end with her grandmother at her summer place on the Noyo River. The Skunk is loading express at the shed down at the other end of the yard but presently comes backing out. She runs past the platform and makes for the wye, turns around and backs down to the platform. The passengers climb aboard. On this run it's the M-100, Conductor Silva, and once again, Motorman Galiani. The M-100 recently received a bright new coat of paint and a new 150-horsepower diesel motor to replace a 125-horsepower gasoline motor that powered her before. It takes only five gallons of fuel to make the round trip, which is really getting operating expenses down to a minimum. And when Silva gives Galiani the two-bell go-ahead signal and the motor takes hold, you know with all that power she can dance.

As the M-100 makes her way toward Willits, you begin to see, for one thing, that the Skunk is all things to all people along the line — common carrier in more senses than one. And you begin to see, too, that the conductor is brakeman, ticket seller, baggage man, express man, milk man, mail man, newspaper boy, and general handy man. We halt beside a little cabin and Silva hands down a single quart of milk to a waiting woman. A minute later Galiani applies the brakes at a crossroad just as a young fellow and girl come riding up on their horses — to receive from Silva their mail and the city paper. All along the line people are out at platforms to see the Skunk go by, to receive their order from the grocery store in Fort Bragg, or to climb on for a ride a few miles along the line.

At one stop a man gets aboard, and his dog, seeing his master being carried away, dashes after the car. At the next station, not far along, the dog catches up just as the Skunk pulls out again. The man leans out the rear end and calls to some small boys, "Hold that dog — hold him!" The boys manage to hold the tugging dog as the Skunk swings around a curve and drops them from view.

A deer springs out of the woods onto the track, bounding easily and gracefully ahead. Just when you begin to think the Skunk is going to catch the deer, the animal leaps off the track and into the safety of the green shadowed forest. Sitting on the seat alongside Galiani, you ask him if he sees many wild animals on his daily runs. "Hardly ever miss," he says. "There are always deer, sometimes coons, skunks — yes, and I've even seen cougars, coyotes, and bears. When a bear crosses the track, looks like a ball of fur rolling along — little black bears, I guess." Once the Skunk scared up a bear which ran across in front of the car and right through the middle of a gang of maintenance men who were having lunch by the side of the track. Galiani still laughs when he thinks about it. "Shoulda seen 'em scatter," he says. "Don't know who was scared worse, the bear or the guys."

At one stop a farmer loads a crated pig into the Skunk and climbs aboard to ride with it. At Irmulco the pig, grunting and squealing, is unloaded, all hands helping to slide it down onto the back of a small car, the tires of which flatten perceptibly. Galiani, who sits in a combined baggage and motorman's compartment, is reminded of a story. "It is a tale of terror," he says, "a midnight ride with a corpse.

"Our car was to leave Willits at 3 a. m. A heavy load of express filled this front compartment so completely that no one could come up here from the rear of the car. Next to my controls was a large box placed so that it would have a natural brace against the curves to come. In the box was a corpse consigned to an undertaker in Fort Bragg."

It was just another run until the Skunk slid into Summit Tunnel. With the bell tolling, and the headlight blazing through the tunnel in ghostly brilliance, Galiani first heard the noise that made a chill run down his spine. It was a grunting sound and it came from the box. "I'll admit I was scared," he said. "But I sat tight and kept at my job. Every time we lurched around a curve, I heard another grunt. Worst of it was, I was cut off from the rest of the crew by a pile of express." It was a cold night, but Galiani was sweating. Every time he began to think he had only been imagining things, the corpse grunted again.

Galiani could have stopped the Skunk and called up the conductor, but he couldn't bring himself to do that. His fear of appearing ridiculous was greater than his fear of the noisy corpse. So the ride of terror went on — interminably, it seemed to the motorman. Then at last the lights of Fort Bragg appeared. Soon the Skunk was in the station and the express was being unloaded under bright lights.

"The undertaker was down to pick up the corpse," says Galiani, "and they lifted the box out. Then I saw a little crate someone had put down alongside it. It was buried under a lot of other packages and boxes."

And what was in that crate? A little red pig! In a fit of temper Galiani threw crate and pig to the ground. The crate broke and off ran the pig, squealing in fright. It was at that moment that Galiani recovered himself and became a railroad man again, solicitous of the property placed in his trust. He gave chase. "Had a hell of a time catching that pig," he says. Finally the pig was cornered and, no worse for the exercise, was placed in the crate and delivered to its consignee.

In the not too distant future, the great redwood forests may become logged out. If so, the California Western will join the hundreds of miles of ghost railroads that touched Northern California's shores. When that day comes, many will shed tears, for this little railroad, one of the crookedest in the world, with its enchanting scenery, its personal service, and its Skunk, has achieved an affection among the people it serves, the like of which most larger railroads never know.

The New York Central and How It Grew

Erastus Corning and the Vanderbilts combined a great many corporations to make up the Central System. Some of them are not even in the railroad business.

BY ALVIN F. HARLOW

While writing *The Road of the Century,** a history of the New York Central Railroad, I amused myself occasionally by asking persons who are by no means ignoramuses, "How many corporations do you think have gone into the making of the New York Central System?" One man promptly replied, "Oh, 25 or 30, at least." Another, after several moments of pondering, said, "I shouldn't wonder if there have been at least a hundred."

Neither of them would get anywhere near a passing grade on the question. The 1942 annual report of the New York Central dryly lists the names of every scrap of track and other item that makes up the great network. There have been about 650 companies. And these are not all railroad corporations, by the way. It takes more than steel rails to make, tie together and sustain a vast organization such as this. Among the corporations which now form a part of the NYC are terminal, bridge, ferry, pier, tunnel, steamboat, streetcar, coal mining, iron mining, realty, stockyard and supply companies, fast freight and refrigerator lines, car building and repair shops.

Many of these are only partly owned. For example, the NYC shares in the ownership of the Terminal Railroad Association of St. Louis with the 15 other railways which enter that city. It shares the Cincinnati terminal station with six other lines, and the Toledo Terminal Railroad with eight others. Among these eight are two of NYC's own subsidiaries, the Michigan Central and the Toledo & Ohio Central. Ownership of the car ferry across the Straits of Mackinac is quite naturally divided (one-third each) among the three roads which touch the straits — the Michigan Central (NYC), Grand Rapids & Indiana (Pennsylvania) and Duluth, South Shore & Atlantic railroads.

The setup of the great Cleveland Terminal is interesting. Although it represents an investment of nearly $90 million, the capital stock of the corporation is only $10,000 — 100 shares, par value $100 each. The New York Central owns 71 shares; its lessor, the Big Four, owns 22, and the Nickel Plate, 7. The terminal and belt lines of Boston, Detroit, Indianapolis, Dayton, Fort Wayne and many other cities are also jointly owned with other systems.

Of the corporations that have been absorbed into the New York Central System by sale or lease, more than 400 have been purely railroad companies. In these I include only corporations which involved actual building or extension of track, not a mere reorganization and change of name.

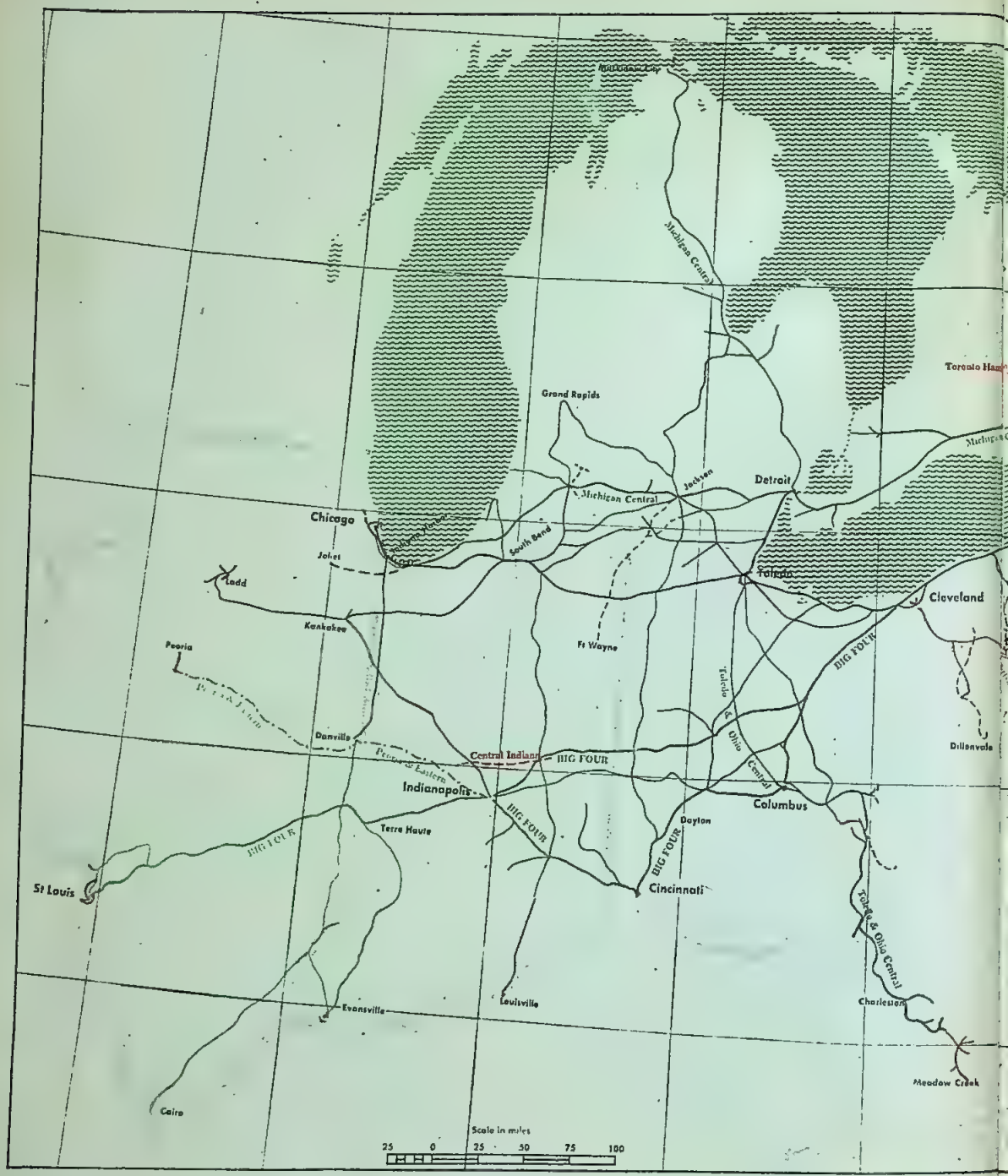
There was usually a fairly sane reason for each reorganization. In some cases it represented a desperate effort to salvage something useful from the wild plans for a line from nowhere to nowhere, and with nothing to go on.

No less than six Northern Indiana Railroad companies existed in mid-19th century, weaving a

*Creative Age Press, New York, N. Y. $4.

Donald Furler, 94 W. Main St., Glen Rock, N. J.

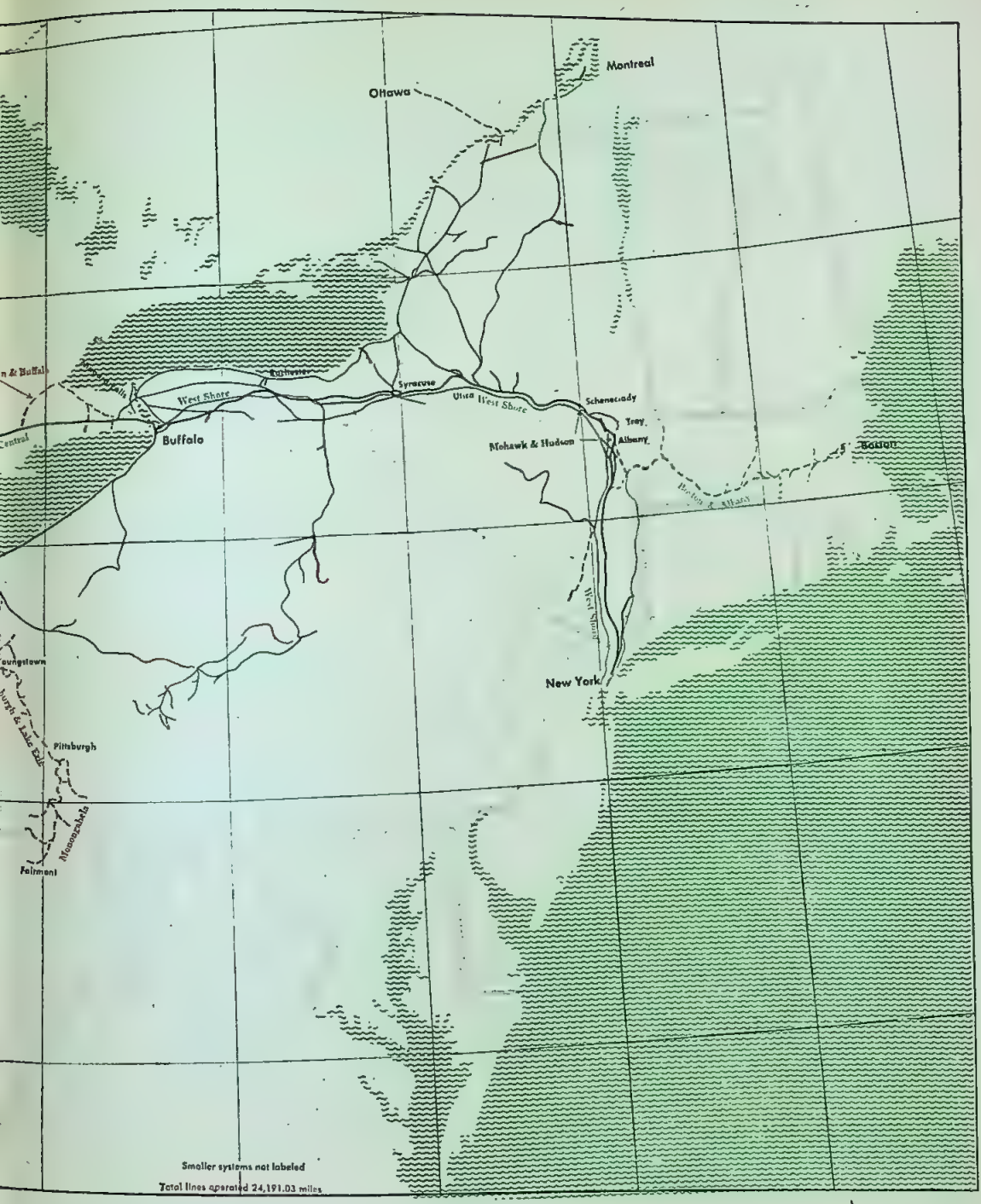
The Wallkill Valley Railroad is now operated as the Wallkill Valley branch of the New York Central. The line runs 39 miles from Kingston to Montgomery, N. Y. Freight↗ is leaving Montgomery.



Lines owned and operated
Lines owned by proprietary companies
Lines owned but not operated
Lines operated under lease — affiliated
Lines operated under lease — non-affiliated

The New York

Map by W. A



Central Family

A. Akin Jr.

Lines rented — affiliated
Lines rented — non-affiliated
Lines operated under trackage rights
Lines affiliated but not operated
Ferries

This Forney locomotive was built in 1877 for the Indianapolis & Evansville Railway, now part of the Big Four and operated by New York Central System.

tangle around each other like six pups all tethered to the same post. It all began with an 1835 charter authorizing the Indiana part of a road running from Maumee Bay on Lake Erie to the rapids of the Illinois River. The promoters hoped that Ohio and Illinois would grant charters through to those waters. Neither Toledo nor Chicago was as yet sufficiently important to be used as a target or even mentioned in the document. The original promoter was with difficulty restrained from christening his dream Atlantic & Pacific. He finally compromised on Buffalo & Mississippi, and somehow wound up with no less than two corporations of that name in two adjoining Indiana counties. The name of one of these was changed in 1837 to Northern Indiana, which may be called No. 1, though the company didn't accept the new title or even show signs of life for another 14 years.

Meanwhile, another Northern Indiana No. 2 — was chartered in 1850 and began throwing a little dirt about. In '51 No. 1 came out of its coma, and for some time the two NI's and the Buffalo & Mississippi squabbled and scuffled in the sand dunes and Kankakee swamps without getting anywhere in particular. No. 1's promoters organized the Northern Indiana (No. 3) of Ohio in 1851; and in '53 these two were fused, becoming Northern Indiana the Fourth, which completed the track from Toledo to Elkhart, the present main line of the New York Central.

Another road, the Michigan Southern (taken over when the State of Michigan failed on the job), had pushed westward from Monroe and Toledo to South Bend in the strong hands of the Litchfield brothers and George Bliss. It was now using bits of track owned by two Northern Indianas and the Buffalo & Mississippi in its push toward Chicago. In 1854 Northern Indiana (4) gathered in the scraps still owned by No. 2 to form a new Northern Indiana (5). A Northern Indiana & Chicago had now been built from the Illinois boundary into Chicago, and in 1855 No. 5 was amalgamated with this to form Northern Indiana (6).

By this time the Michigan Southern was the real god in the machine, and even before No. 6 was born the State of Michigan had given its blessing (soon followed by Indiana) to No. 6's consolidation with the Michigan Southern as the Michigan Southern & Northern Indiana Railroad. In 1869 this road was combined with the roads east of Toledo to form the grand old Lake Shore & Michigan Southern.

The minutes of the directors' meetings of 366 of these corporations, living and dead, are now in the big fireproof vault of the secretary's suite in NYC's offices in New York. This vault also holds many minute books of stockholders' meetings, executive and finance committee meetings, journals and whatnot. I spent much of the winter of 1946-7 in their company, and very pleasantly, too. What has become of the other minutes no one knows. Even the minutes of some of the little roads in western New York which went into the original New York Central chain have disappeared. Some of them may be hidden away in local libraries or historical societies.

These minute books are of the most amazing variety. Some are huge affairs, weighing many pounds, and evidently made to order. Other companies started with a comparatively small account book, such as you could buy at a stationary store for a dime or so. Many are made of the hard blue paper which was much used before 1860. Some of the ink is as black as when the entries were first written, away back in the 1830's and '40's, while other ink — perhaps homemade of the juice of oak-galls, iron rust and whatnot — has faded to various shades of brown and isn't so easy to read, especially if it's on that blue paper. There is little scrawling, for contrary to modern practices, most children were taught good penmanship. But some of the secretaries grew eccentric and tried to make their script very distinguished — making up-strokes so thin as to be almost invisible, and bearing down on the down-strokes like a ton of bricks. It makes an impressive page, but is infernally hard to read. Some secretaries who were proud of their skill with the pen made the first page of their books, describing the organization of the company, a gorgeous affair, with many curlicues and perhaps in two or three colors — red or purple and green in addition to the black.

The minutes vary as widely in their interest as in their physical appearance, depending somewhat upon the character of the secretary. Some are just the dry bones of what happened; others are more descriptive and may even have bits of color. Some of the directors' doings are quaint enough in themselves to be good reading; at times they made as much fuss over a five- or ten-dollar item as boards of later years would over a hundred thousand. There are bright pages of other sorts, too — like those of the Indianapolis & Bellefontaine, one of the early units of the old Bee Line (later Big Four), which was incorporated in 1848 with Oliver H. Smith, an Indianapolis lawyer, as president.

Smith was a spellbinder who never missed a chance. When

he was first elected, and year after year when re-elected, he invariably impressed upon the board in a rumble-bumble oration that he had "never sought nor desired the office," that it would entail "heavy professional sacrifices" which would almost seem to forbid his acceptance, and that nothing but a sense of duty and a strong belief in the importance of the work induced him to yield. To him the project was "this great enterprise," "this mighty national work which is worthy of the age," etc.

"It will be one of the most gratifying incidents of my life," Smith said, in one address, "to pass over this great line from the Atlantic to the Mississippi, which I confidently expect yet to do." (The road when completed ran from Indianapolis to Union City, 85 miles.)

For nearly five years Smith was president, also stock and bond salesman, general manager, superintendent, purchasing agent — in fact, like Poo-Bah in *The Mikado*, he was Lord High Everything. To do the man justice, he did sell a great deal of paper, even if at a discount. But some of the directors thought he was drawing too much salary — a cool $1000 a year! — for a man inexperienced in railroading, and they suggested a superintendent to take over the management of the road, "the president to preside at all meetings of the board, conduct the correspondence, etc."

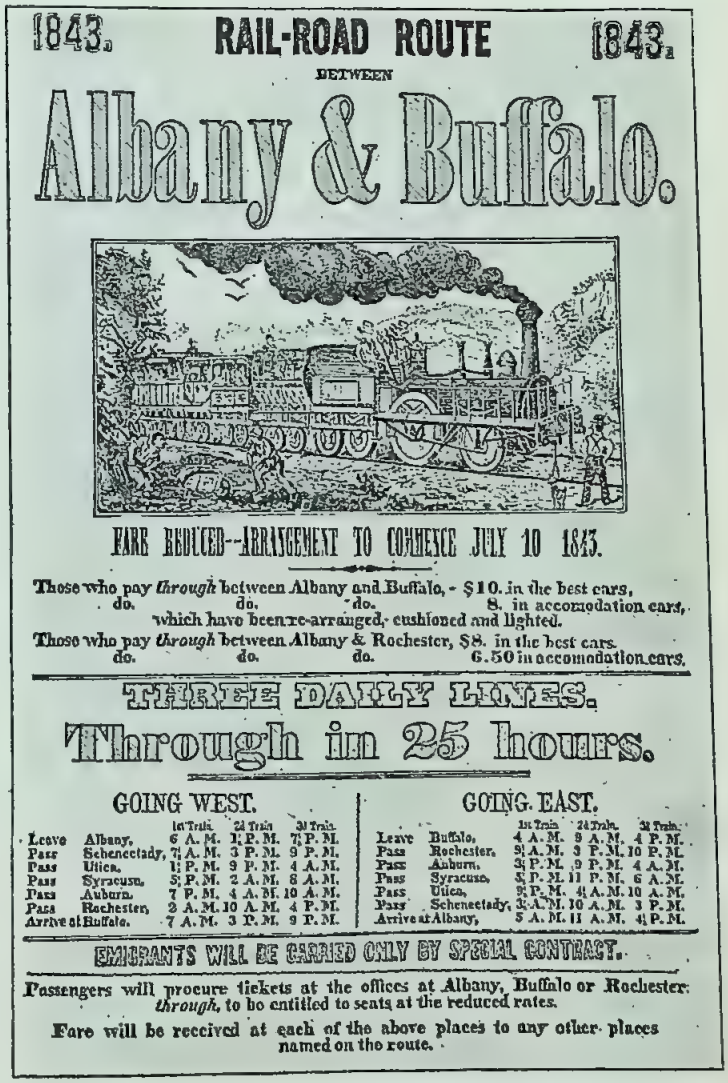
Smith was mortally offended; his proud spirit rejected the idea of letting someone else operate the road. His letters on the subject are in the minutes. "You may find a man who is willing to sacrifice his honor and become your servant," he wrote, "but you have noticed my public and private life to little purpose if you suppose I can be induced by any earthly consideration to occupy that position." So out he flounced.

But it wasn't long before he bobbed up again as promoter and president of the Evansville, Indianapolis & Cleveland Straight Line Railroad. He wrote nonchalantly to his old company as well as to the Bellefontaine & Indiana and the Cleveland, Columbus & Cincinnati — which carried the line onto Cleveland and later comprised the Bee Line — agreeing that if the three of them would invest $200,000 in the stock of his road, he wouldn't carry the track farther than Indianapolis.

The other roads did not seem to quail before his threat, and Smith's line never even reached Indianapolis. Some years later, what there was of it was joined to a 26-mile fragment straying southeastward from Terre Haute — the beginning of a projected Terre Haute & Cincinnati Railroad — to form a sort of hockey-stick-shaped affair still known as the Evansville & Indianapolis. The E&I for many years was a dependency of the Evansville & Terre Haute, and later, under the name of Evansville, Indianapolis & Terre Haute, came into the hands of the New York Central.

This urging, cajoling and bluffing by embryonic or youthful railroad projects in the effort to induce older, established companies to aid them in getting started is a thread that runs constantly through the early history of American rails, and has played no little part in making our rail systems what they are.

The New York Central began as the 17-mile Mohawk & Hudson, from Albany to Schenectady. It



Seven railroads cooperated in running through service between Albany and Buffalo in 1843. They became integral parts of the original NYC in 1853.

was chartered in 1826, but not completed until 1831, when the feeble little *De Witt Clinton* locomotive, American-made by amateurs, tottered forth after sundry breakdowns, drawing a small string of stagecoach bodies on wheels. A plateau 200 to 300 feet above sea level lay between the two termini of the road, and the construction engineers, who knew more about canals than about railroads, didn't know how to overcome this formidable hump save by inclined planes at each end. Some years later, another and better line was built up a ravine out of Albany and down another at Schenectady. This was where the NYC mainline tracks are now located.

Scarcely had the Erie Canal linked the Hudson with the Great Lakes in 1825 when the railroad came along and began to draw a deadly parallel with the canal's course. At first the railroad was an aid to navigation for there were many locks in the roundabout canal between Schenectady and the Hudson River. Soon railroads paralleled other parts of the canal. West of Schenectady the next link in the chain was the Utica & Schenectady, locally promoted, as all railroads were then, and limited in length. To finance just one railroad all the way to Buffalo at one swoop would probably have been an impossible task at that time. Too many people still doubted that rails would ever compete successfully with waterways, and promoting on a big scale was still unknown. So our great eastern systems for the most part had their start as strings of little neighborhood roads.

After the Utica & Schenectady came the Syracuse & Utica, then the Auburn & Syracuse, the Auburn & Rochester, the Tonawanda, and the Buffalo & Attica. These seven roads completed a chain from the Hudson to Lake Erie. Three more little lines were built around the west end, linking up Lockport, Batavia, Buffalo and Niagara Falls. A line from Schenectady to Troy at the east end and a short cut from Syracuse to Rochester were also built, so that there were a dozen sectors all told. The stronger companies in this chain bought stocks and bonds of the weaker, lent them money and even rolling stock to enable them to get going so as to make the line a more efficient tool of transportation.

It wasn't long before through cars and then through trains were running over the several roads. In a few years they were advertising as the Buffalo & Albany or Albany & Buffalo Railroad, and finally the string was being widely spoken of as the New York Central, even before such a corporation was created in 1853. Welding of the little companies into one was a desirable thing, both for the public and the railroads, though it was assailed with the cry "Monopoly!"

But while they were still separate concerns, they began aiding other roads to the west, to give themselves outlets. In 1851 a delegation from Detroit and the new Michigan Central Railroad came over to ask them to help finance the Great Western of Canada. The GW was trying to get going and would become a needed link between Buffalo and Detroit. Five of the New York roads bought $500,000 worth of GW stock, the Utica and Schenectady alone taking $200,000. Three of the chain also bought stock in the Buffalo & State Line, which was pushing along the Lake Erie shore through Dunkirk toward Ohio, thus beginning the Lake Shore & Michigan Southern from the eastern end.

In this manner the interlocking of ownerships began, and it was not a mere foul plot on the part of big business to monopolize everything; it was a desire on the part of directors of small (and some of them shaky) corporations to make their investments more sound and more profitable.

Erastus Corning, first president of the New York Central, was an iron merchant in Albany, so that was where the Central's offices were established upon its organization in 1853. Theoretically, Albany is its headquarters yet, though all the head offices and brass hats are in two big buildings in New York City. But the big corporation's annual meeting is held on the second floor of the Albany station in a neat, unpretentious board room with the usual long table and portraits of Corning and Commodore Vanderbilt on the wall. This is one meeting which the NYC president never fails to attend.

To pick up another germ of the system, a little horse-car line was organized in 1832 in New York City. It ran along the Bowery and Fourth Avenue and was intended to become a suburban line. Its name was New York & Harlaem, though it didn't seem as if it would ever get to Harlem, only about 6 or 7 miles away. (The spelling "Harlaem" in its name wasn't changed to the modern "Harlem" until 1889.) But after a while it did reach that outlying village, then got ambitious, crossed the Harlem River and slowly pushed up through the country with a notion that it was headed for Albany.

I said that more than 400 railroad corporations made up the New York Central; I should have added that there was also one privately owned road. When the Harlem railhead crept up through what is now the Borough of the Bronx, it passed through the estate of Gouverneur Morris, one of the NY&H directors. Morris was the son of another Gouverneur Morris, our ambassador to France under President Washington. He was also a nephew of Lewis Morris, one of the signers of the Declaration of Independence. They all now lie buried with other kinsmen in the yard and crypt of St. Ann's Church in the Bronx. The Morris domain was a little principality which included the village of Morrisania, now a local stop on the Harlem Division.

In 1849 Morris built a 2⅛-mile branch from the Harlem track over to a landing on the East River which he called Port Morris. The New York & Harlem bought the line from him in 1853 for $118,000, and has it yet. The right of way has been moved slightly, the tracks have been sunk and they now tunnel under a small park, but Port Morris is a useful freight yard for the New York Central to this day.

The Harlem never got to Albany, for in 1846 a group of Poughkeepsie businessmen organized the Hudson River Railroad, just about the peppiest, most dauntless concern in early railroad history. It built a 145-mile line from New York to Albany through some of the

TRAINS collection.

The New York Central at Benson Mines, N. Y.: In those early days the railroad was known as the Carthage and Adirondack, which was later absorbed by the Rome, Watertown & Ogdensburg. The line ended at Benson Mines when this picture was taken; now it continues on three miles to Newton Falls.

toughest terrain yet tackled by engineers, and did it in five years, launching its first train in 1851. In New York City the line continued down the Hudson River shore to lower Manhattan, the route now used by NYC for its important west side freight track, the "life-line of New York."

Cornelius Vanderbilt, then in his fifties, was nicknamed the "Commodore" because he was by taste and occupation a shipping man. He had picked up a few railroad stocks just to have something to spend his money on, but in general he considered railroads negligible. But in 1853 a slick New York broker, who was also president of the Harlem, inveigled him into buying a big block of Harlem bonds, paying 10 per cent down according to the usual custom. When this man turned out to be a defaulter a year later, the Commodore was inclined to repudiate the transaction, but after much wrangling with the directors he agreed to go through with it. He was in railroads for the rest of his life. It wasn't long until he was at the head of the Harlem. He liked the game more and more every minute and soon acquired a controlling interest in the Hudson River Railroad.

Upstate, the Commodore found that he had to depend on the New York Central as his outlet west from Albany, and the NYC's heart wasn't always true to him; in summer, when the Hudson was free of ice and the palatial river boats were running, it was likely to send its freight and passengers to New York by water. The Commodore's son, William H.—considered by many old-timers a greater railroad genius than his father—was now his chief lieutenant, and one or the other of them decided that they must get control of the Central.

Some readers have probably heard that the astute Chester W. Chapin, for years president of the Boston & Albany, saw the NYC as a natural western extension of the B&A and tried in vain to induce B&A backers in Boston to buy control of it in the 60's when it could be had below par. But Chapin, though a Massachusetts man, was from Springfield, and anyone who saw the play *The Late George Apley* will surmise that 80 years ago, ideas originating outside of "Bahston" were likely to be coolly received on Beacon Hill and in State Street. It was an odd thing, too, for State Street really built a number of the continent's great railroads — the Michigan Central, the Burlington, the Santa Fe, the Mexican Central and others.

Anyhow, Boston ignored Chapin, and Vanderbilt took over the Central and merged it with his Hudson River in 1869 to form the New York Central & Hudson River Railroad, which was the official title for 45 years. Chapin did become one of the Commodore's trusted counselors as well as a New York Central director, and any good astrologer could then read the horoscope of the Boston & Albany. How different the course of railroad history might have been had those Bostonians taken Chapin's advice! Would "the Vanderbilts" have been as great a force in rail affairs as they have been? One fancies that it would have been difficult to confine the Commodore to a limited territory. Now

George M. Sittig, 193-10 Woodhull Ave., Hollis, N. Y.

Kanawha & Michigan was part of the Ohio Central Lines when NYC took over. Engine 559 became NYC 9504.

Vanderbilt possessed two railroad lines into New York City, a little more than a mile apart. Common sense indicated that the passenger business should be concentrated on one of them. But which one should it be? The Hudson River Railroad, with a line through from Albany right down to the big business district and within shouting distance of Wall Street, seemed to be the unavoidable choice. But there were other considerations; the city was growing rapidly and magically northward. On the Harlem, the operation of steam locomotives south of the local stop at 42nd Street had been forbidden by the city. The Commodore decided here was a future center of business, and so, in 1869-72, he built the first Grand Central Station.

I say "he," but in reality the station was created by the New York & Harlem Railroad, which owned the ground and right of way leading to it. The Harlem road was never actually merged with the New York Central as the Hudson River Railroad was. Instead, the Central leased it in 1873 for 500 years. But apparently fearing that this brief leasehold wouldn't give them time to carry out all their plans, the Central directors in 1889 had the lease redated so that now it expires in 2389, which gives them more room to turn around in.

If you are lucky enough to own any Harlem stock — and if you do, you certainly *are* lucky, for it is one of the sweetest little investments I know of, drawing a straight 10 per cent yearly — your descendants will be receiving nice checks for many generations. There is not too much of the stock running at large — only about half a million dollars' worth — for the NYC owns approximately 95 per cent of it. Its par value is $50, but if you had a chance to buy a share you would pay a pretty penny indeed.

So when that vast beehive of traffic and commerce, the Grand Central Terminal, came into being in the 20th century, it was constructed by the New York & Harlem Railroad on its own property. The New York Central and the New Haven railroads are merely tenants there. But for 2½ miles north from the station, tracks and trains are buried underground beneath dapper Park Avenue, now the swankiest residence street in town; and a station with 49 platform tracks necessarily creates a big subterranean yard which overflows into property adjacent to the station and the avenue, and is now occupied at the upper levels by apartment and office buildings, hotels and whatnot. Some plots of this are owned by the Harlem, some by the Central, and three — the Commodore Hotel is on one of these — by the New York State Realty & Terminal Company, of which the Central possesses all of the stock.

The big New York Central office building which stands just north of the station, with Park Avenue passing through it by four tunnels, is on ground owned one-third by Harlem, one-third by the Central, and the middle third, the width of Park Avenue, by the Harlem and Central jointly. How all this came about would take too long to tell; it just grew, as a city grows, or as our landscape grew. The Central owns the land on which the Graybar Building and the Biltmore and Waldorf-Astoria hotels stand. Of course none of these buildings have basements. Directly under the buildings, electric locomotives prowl hither and yon, and some of the nation's finest trains roll in and out, passing alternately over Central and New York & Harlem land. The tenants above hear never a whisper of them. Many are not even aware that they are there.

When the American Locomotive Company proudly unveiled its 75,000th locomotive at the Waldorf last fall, guests just went down underneath the hotel's lobby and there she was. Artificial grass underfoot and brilliantly lighted scenery all around simulated a Santa Fe landscape; you'd never have known you were in a railroad yard. But once I heard a rumble and the tinkle of a bell, and looking through a crevice in the scenery into the great, dimly lighted cave with its maze of tracks, I saw a New Haven electric yard engine ambling by with a string of cars.

In order to come down the Hudson River Railroad and enter the new station, a connection had to be made between the Hudson River and the Harlem. So in 1869 the Spuyten Duyvil & Port Morris Railroad Company was incorporated to build track along the north bank of the Harlem

River from Spuyten Duyvil to the Harlem track at Mott Haven. This was a leased road until 1913, when it was merged, along with others, into the Central.

In the 1860's, even before he had clinched his hold on the original New York Central, Commodore Vanderbilt (largely upon the advice of his son William) bought into Michigan Central, and also into the chain of roads along the south shore of Lake Erie. Space is lacking to tell of the birth and struggles of those eight little railroads between Buffalo and Toledo which consolidated with the Michigan Southern & Northern Indiana in 1869 to form the Lake Shore & Michigan Southern. Even as that came about, Vanderbilt had voting control. Neither is there room to tell of the pioneer Cleveland, Columbus & Cincinnati, the Bellefontaine and others which eventually became the system known as the Bee Line. Through all this story we find the stronger companies striving to better their business prospects by buying stock and bonds of newer concerns to westward, aiding the latter to get on their feet and supply more inlets and outlets.

We find the Cleveland, Columbus & Cincinnati buying securities of the Bellefontaine & Indiana, the Indianapolis & Bellfontaine, and then even of the Terre Haute, Alton & St. Louis (or as later re-scrambled, St. Louis, Alton & Terre Haute). All of these later became parts of the Bee Line. Even the Michigan Southern bought THA&StL paper to such an extent that old John B. Jervis, Michigan Southern magnate, was for a time president of the other road. Then when the Pennsylvania got control of the only pair of rails between Indianapolis and Terre Haute, the Bee Line and others organized the Indianapolis & St. Louis Railroad and slammed it through from Indianapolis to Terre Haute in record time, completing what is now the Big Four's east-west main line to St. Louis.

In mid-century some little concerns fumbled their way over the terrain between Cincinnati and Chicago, and fell into the hands of a group of persons who were doing nobody any good but themselves. In 1870 the eastern stockholders, mystified and annoyed by the course of events, sent a bright young Yankee lawyer named Melville E. Ingalls out there to find the monkey wrench.

Ingalls was only 28 and had grown a beard to conceal the fact and give him authority. He tore things up by the roots, reorganized the company and brought forth the original Big Four, the

The Pittsburgh & Lake Erie line from Youngstown to Pittsburgh has four tracks and is one of the heaviest traveled lines in the country. Baltimore & Ohio has trackage rights between New Castle Junction and Pittsburgh, and routes all through trains over PL&E. Train is at Beaver Falls.

Richard J. Cook, 3402 W. 135th St., Cleveland, O.

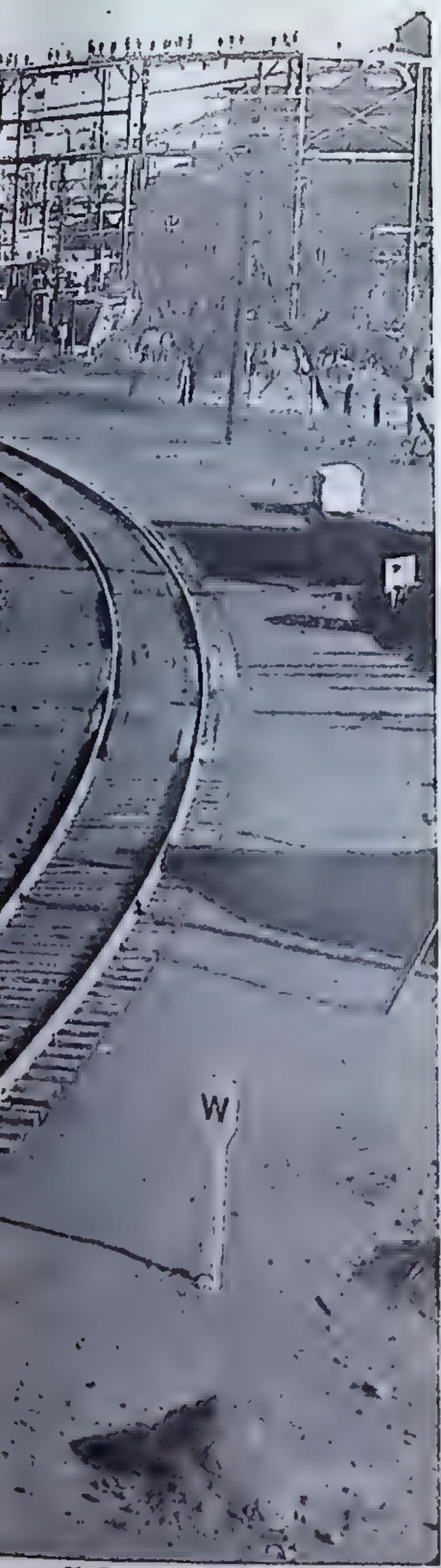
New York Central freight train at Corning, N. Y.

Cincinnati, Indianapolis, St. Louis & Chicago, running from Cincinnati to Kankakee, Ill., with trackage rights into Chicago. He had to nurse the road through a couple of receiverships, and he aided in the birth of some minor companies whose little lines finally became parts of his own.

Ingall's ability attracted the attention of the Vanderbilts, who had been investing heavily in the Bee Line, and in 1889 they sponsored him in the consolidation of that road with his own to form the new Big Four, the Cleveland, Cincinnati, Chicago & St. Louis — which from that day forward was known to the public as a part of the "Vanderbilt lines."

Ingalls had become a through-traffic ally of C. P. Huntington, of Central Pacific fame who was by then in control of the Chesapeake & Ohio. Through that alliance Ingalls was made president of the C&O for several years, concurrently with his Big Four executive job. In fact, it was through Ingalls that the NYC for a brief time held a dominant interest in the C&O. One of the little side-lines along the Big Four which were built during Ingalls' presidency was the Vernon, Greensburg & Rushville, connecting the old Big Four main line at Greensburg with North Vernon, where the Louisville branch of the Ohio & Mississippi left its main line. After the O&M had fallen into the hands of the Baltimore & Ohio, Ingalls asked the latter for trackage rights into Louisville and was refused. He then ran a survey of his own to Louisville, and the B&O gave in.

Collaborating with Huntington,



H. D. Runey, Horseheads, N. Y.

Ingalls had already organized the Louisville & Jeffersonville Bridge Company and was building a bridge across the Ohio. The NYC later purchased the C&O's share in the corporation, and now has valuable terminal and trackage facilities in Louisville.

Back in mid-19th century, every town with any energy at all wanted connection by rail with the outer world. The rails lifted thousands of communities, yes, whole counties and states — from the mud and poverty of the frontier into affluence. I have read tributes to them in many a county history, telling how farmers and their families were still living in pioneer conditions, dressing in homespun and going barefoot half the year, slogging through mud to the nearest village to sell their corn for a dime a bushel and pork for one or two cents a pound; and how the railroad opened a new world, put large city markets at their doors and gave them comforts of which they had never dreamed.

Small wonder, then, that this promotion of little lines became a sort of racket. When Cornfodder Crossroads yearned for a railroad, some of its leading citizens would ask for a charter for a line leading to a more important one near by or to the place where one was going to be built, doing this in the belief that the big fellow would extend a helping hand by buying stock and lending money and equipment. Perhaps they frankly hoped that he would absorb their little pumpkin vine. They would solicit subscriptions at home and all along the route to Jonesville, where they joined the bigger road; they would draw up estimates of the enormous traffic which the Cornfodder Pacific would contribute to the nation's economy — lumber, limestone, cattle, corn, cheese, butter, barrel staves, hoop poles, etc., not to mention the thousands of citizens who were pining for the opportunity to travel, and with this they would bring pressure on the larger company.

Sometimes a little road, or one not so little, was planned by an ambitious promoter, either local talent or a city feller, who hoped to garner something out of the proceedings for himself, and too often did. More than one of these proved to be a pretty smooth operator. General Ambrose E. Burnside, whose whisker-cut has been for some strange reason twisted in modern parlance into "sideburns," barged around the Middle West after the Civil War.

Burnside was largely responsible for the Indianapolis & Vincennes, the beginnings of the Cairo, Vincennes & Chicago, the Fairland, Franklin & Martinsville, and 26 miles of track out of Terre Haute. This latter originally headed towards Cincinnati but is now the upper end of the Evansville, Indianapolis & Terre Haute. All of these but the I&V are now New York Central track. Anyhow, the General went home with some cash and probably some new customers for his Rhode Island Locomotive Works, which he and others had founded in 1866.

Some of the promoters were Amateurs with a capital *A*, as proved by some delightful letters in New York Central files, especially at Cleveland. There I read one written in 1875 by the secretary of the Frankfort, Kokomo, Marion & Ottawa Railroad, who was evidently behind the times on railroad news. The Michigan Southern & Northern Indiana had long since been combined with the lines east of Toledo to form the Lake Shore & Michigan Southern, but this gentleman was only vaguely aware that some changes had been taking place. He addressed his letter to "President of Lake S & N Ind & S Michigan Railway Co," and hinted at connection and possible absorption by the Lake Shore. He claimed "an organized line from Kokomo to the Ohio line by the way of Kokomo, Marion, Bluffton and Decatur, with the prospect of extending any time we name east to Cleveland."

In short, he was giving the Lake Shore a chance to buy in and save itself from dangerous, perhaps fatal, competition.

Now, the president of the Lake Shore at the time was a hard-headed old gentleman named Cornelius Vanderbilt, whose office was in New York, who evidently never saw this letter and probably wouldn't have answered it if he had. The FKM&O eventually became a part of the Lake Erie & Western, which, by the way, was under some dominance by the NYC from 1899 to 1922.

Another letter in the Cleveland files is from the secretary of the Paw Paw Valley Railroad — who apparently had left school too soon — to J. H. Devereaux, then (1870) president of the Lake Shore. I quote from it in part:

"This road is intended to run from Benton Harbor on Lake Michigan to Schoolcraft to connect with your Road. The Company was promist the indorsement of their Bonds by Mr Philips the former President of your

Road, provided suficant aid was raised to graid and tie the Road. I took the matter in hand and succeeded in getting $220-000 raised by voting in the townships soon after this came the disision of the Supreme Court of Michigan which rendered the bonds of no avail. . . . The people along the line are very anxus to have the Road built. . . . They will now subscribe enought to graid and tie and give other advantages. This Road runs throught a splendid country," etc., etc.

Again, the sales talk failed to arouse a sign of interest.

A favorite device of the small-time promoters was that of playing off one big neighbor against another, often causing one or another to grab their little pig-path lest a rival get it and perhaps make a considerable nuisance of it. One cannot indict all these early promotions as unworthy. Not only were many communities built into prosperous cities, but many of those little lines paid well for years. Some became vital links in a system; others are useful yet. Some, as the years went by, either had to be given adrenalin to keep them on their feet, or left to their fate. Scores of them are in the *Official Guide* now, marked "Freight Service Only," while thousands of miles of similar track has been dismantled.

Some curious examples of attenuation are found among railroads which came into the NYC family long ago. The Detroit, Toledo & Milwaukee as late as 1897 extended from Dundee to Allegan, Mich., 133 miles. Now it has shrunk to three little batches of yards and sidings at Battle Creek, Marshall and Tecumseh, totaling 14.33 miles. The New York & Fort Lee, just across the Hudson from the big town, once owned 2½ miles of track; but it has been run over and trampled under foot by the West Shore and the New Jersey Junction, both NYC subsidiaries, until now it owns nothing at all; it is just a ghost. But as the NYC owns all its stock, no complaints are heard.

The Erie & Kalamazoo, one of the pioneer rails of the Middle West, incorporated in 1833, built a track from Toledo to Adrian, and leased itself to the Michigan Southern in 1849. The NYC is the inheritor of that lease. Old Time's snaggle teeth have gnawed off both ends of the road so that now it extends only from Vulcan, just outside of Toledo, to Palmyra, Mich., 21.82 miles. Unlike some other leased or controlled lines, the E&K is all privately owned. Its annual meetings are still held at Adrian, and its directors are scattered from New England to Wyoming. I recently met in Detroit the proud possessor of one of its $50 shares.

Several other privately held roads are in the NYC family. The biggest is the Boston & Albany, of whose $25 million stock the Central doesn't own a dime's worth. Harold Vanderbilt owns some of it, for he was a director the last time I looked at the book, but he's just about the only foreigner on the board; the rest are practically all New Englanders. The B&A maintains its high-ceilinged executive offices and board room, hung with portraits of past presidents, in South Station, Boston, and its president is still a State Street banker. To Massachusetts it is still very much alive, and why not? Its stockholders draw a juicy 8 per cent annually, from the lessee, come good times or bad, hell or high water, and will continue for the next 53 years.

The Fort Wayne & Jackson and several smaller leased roads are also entirely free from NYC ownership. Among the quaint little examples is the Mt. Gilead Short Line, 1.08 miles of track all told. It is owned by the city of Mt. Gilead, O., and therefore has no capital stock and no annual meeting day, and is governed by trustees. Another is the North Brookfield Railroad, a 4.16-mile connection of the Boston & Albany, 90 per cent of whose stock is owned by the town of North Brookfield, Mass. The Amsterdam, Chuctanunda & Northern possesses only about a mile of track in the factory district of Amsterdam, N. Y.

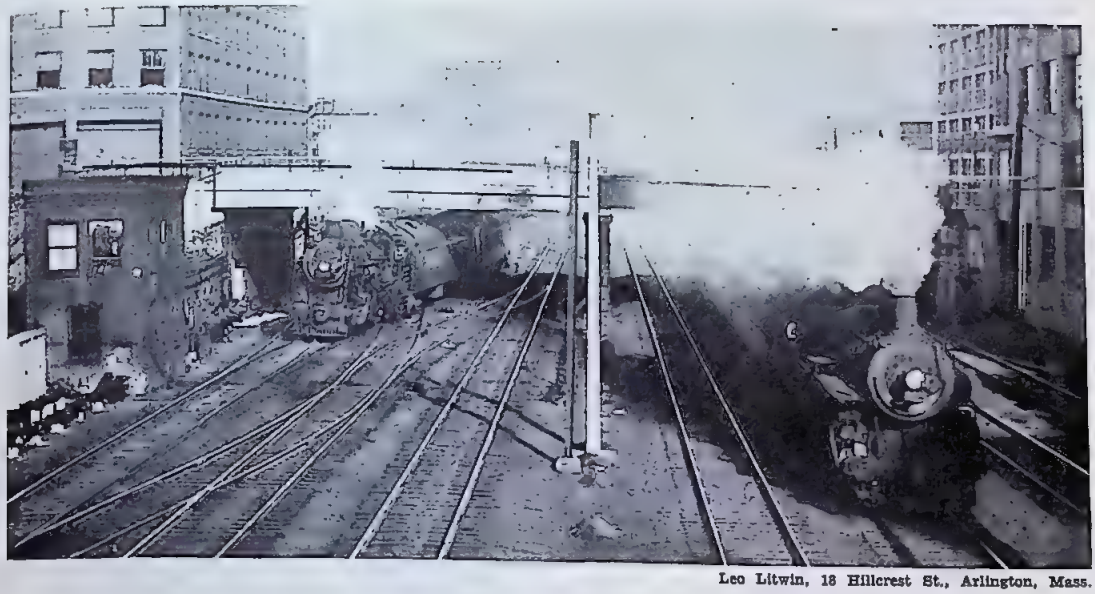
On the other hand, some large roads are totally owned by the NYC—all of the $10 million stock of the West Shore (which in turn owns all the stock of the Wallkill Valley), all of the Toledo & Ohio Central's nearly $10 million, the Lake Erie, Alliance & Wheeling, and several more. Some may ask why the NYC doesn't just eliminate such companies, merge them with the Central and save a lot of bookkeeping and red tape. Well, that's easier said than done. First, such an intention has to be explained to and argued out with the state and the I. C. C. and maybe a lot of bondholders and local objectors, and then a thousand and one legal entanglements would have to be unraveled.

The NYC has wiped out some of the smaller corporations. In 1938, for example, a hunting party from the New York office killed three companies in one day on the midwestern prairies, which is considered a pretty good bag in railroad circles. All were little feeders of the Big Four. NYC plans for the elimination of others, even the Toledo & Ohio Central, when it has time.

The Central has some half ownerships, too, such as the Central Indiana, a 42-mile pike owned jointly by the Big Four and the Pennsy, that is operated independently. To insure a coal supply, the NYC some years ago made a deal with the C&O under which they went in 50-50 on building the Nicholas, Fayette & Greenbrier Railroad, a 104-mile network opening up some new coal fields. Among other partnerships, the cutest one of all is that with the Lehigh Valley in the possession of the Owasco River Railroad, a midget owning .82 mile of track located in the city of Auburn, N. Y.

When in 1912 the directors decided to merge the Lake Shore & Michigan Southern—long controlled through ownership of a majority of its stock—with the Central, they found they had taken on a man-sized job. First, they had to get the consent of 75 per cent of the debenture holders, and that took two years of ardent salesmanship. Meanwhile, they were having trouble with an organized group of stockholders who held out for big money—and got it. When the deal was finally completed, the administration looked at the costs, wiped its collective brow, and said, "Never again unless we own all the stock."

So the Big Four and the Michi-



Leo Litwin, 18 Hillcrest St., Arlington, Mass.

The New York Central's Boston and Albany shares the same depressed cut with the New Haven, although tracks and stations are separate for the first mile from South Station, Boston. A B&A local↖ races an NH train↑ to get commuters home.

gan Central still remain unmerged, just on lease — though the NYC owns more than 96 per cent of the Big Four stock issue, and more than 99 per cent of the Michigan Central. The amount of dividend money transferred from one pocket to the other is not serious. In turn, the Michigan Central owns a considerable majority of the stock — not to mention a 999-year lease — of the Canada Southern, which supplies the vital link between Buffalo and Detroit.

And there are several instances of wheels within wheels — for no sinister purpose, but usually because things just worked out that way. Take that busy little cup of tea known as the Pittsburgh & Lake Erie, the most intensely industrialized 125 miles of railroad territory in the world. John Newell of the Lake Shore saw the enormous possibilities in it when it was first proposed in 1877, and it was through his influence that William H. Vanderbilt became interested in it. The NYC owns a majority of the stock of the P&LE proper, which runs from Youngstown to Pittsburgh. In turn, the Pittsburgh, McKeesport & Youghiogheny, which carries the line on up the gulches through McKeesport to Connellsville and Brownsville, is owned by the P&LE with 39,597 shares, and by the NYC with 39,596 shares. It is also leased to the P&LE for 999 years.

Then comes the Monongahela Railroad, a network of crooked trails pushing still farther into the coal-packed mountains, even into West Virginia; and that is owned jointly by the P&LE, the Pennsy and the B&O, one-third each. Two quarto pages of fine print are required in the NYC annual report to tell how this was pieced together from smaller lines and how the tangled ownership came about. Also there is the Pittsburgh, Chartiers & Youghiogheny, whose 18.84-mile trackage is in three bits, one of them on an island in the Ohio River. PC&Y's ownership is split between the P&LE and PCC&StL.

The Mahoning State Line Railroad, 6.39 miles long, is both owned and leased by the P&LE. The Youghiogheny Northern, 2.01 miles of it, is mostly Pittsburgh-owned but is operated by the PMcK&Y on a yearly lease at a rental of $1 per loaded car. Finally, and most remarkable of all, there is the Pittsburgh & Clearfield, organized in 1906, stock all owned by the P&LE, but of which the report says tersely, after 40 years, "Road has not been built."

Do you wonder that in the comptroller's office and other accounting departments of the New York Central they must have books with pages about the size of a middle-western township, and that you may frequently see four or five men with heads together over one of them, debating a major or minor item as if it were the splitting or resplitting of the atom? For they must be accurate to the hair, else someone is likely to scent a scandal.

As I figure it, the president of the New York Central is — ex-officio, you might say — usually president of about 40 corporations, all told. The number varies as it is or isn't his turn to be head of one or more of the terminal or belt line companies. The layman would probably fancy him saying to one of his secretaries on Monday morning, "Let's see, do I have any annual meetings this week?" Actually, nothing of the sort happens. The only annual meetings he attends are those of the New York Central at Albany, the New York & Harlem, right there in his own building, and, usually, the Big Four at Cincinnati and the Michigan Central at Detroit. At the other meetings, somebody from the secretary's office shows up with a brief case and some proxies to represent the Great White Father. If it's one of those cases of total stock ownership by the NYC, the routine, as you may imagine, doesn't take up much time.

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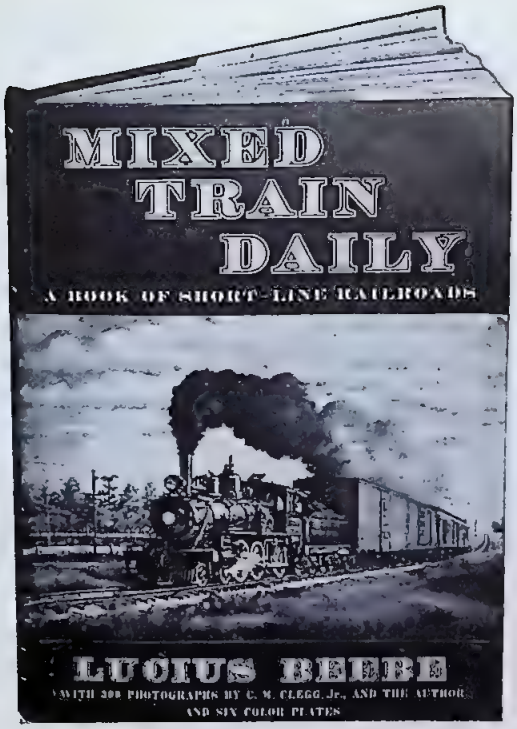

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Ocean Shore Railroad

Back in 1905 a group of San Francisco financiers organized the Ocean Shore Railway with the intention of building a double-track shoreline railroad from San Francisco south to Santa Cruz, 92 miles. Ultimately, they planned, the line would be electrified, but in the early stages steam power was used. Bedeviled by landslides and an earthquake in 1906 which toppled "half the right of way into the Pacific," the company went into receivership in 1909 and the line was never finished, although after its reorganization in 1911 as the Ocean Shore Railroad the company operated a single track to the outskirts of San Francisco by electricity and continued with steam power to Tunitas, 38 miles south. At the opposite end of the line steam trains operated between Swanton and Santa Cruz, 15 miles. Much work was done on the intervening miles, and even today, 28 years after the railroad's abandonment in 1920 because of a strike, it is possible to trace the route by trestle foundations, cuts, and gradings which never saw a tie. Some years ago the Ocean Shore Railroad Company sold the right of way to Ocean Shore Railroad, Inc., and the new owners planned to rebuild the line. Before this could be done, however, the state condemned parts of the route for use as sections of the new Coast Highway, and although restoration of the railroad is still urged periodically it can never again run along its original right of way for the entire distance. The corporation is suing the state, asking that it be forced to buy the remaining portions of the right of way because they were rendered worthless by the state's acquisition of the key sections. Photograph by C. D. Whittaker; from W. C. Whittaker, 1217 Hester Avenue, San Jose, Calif.

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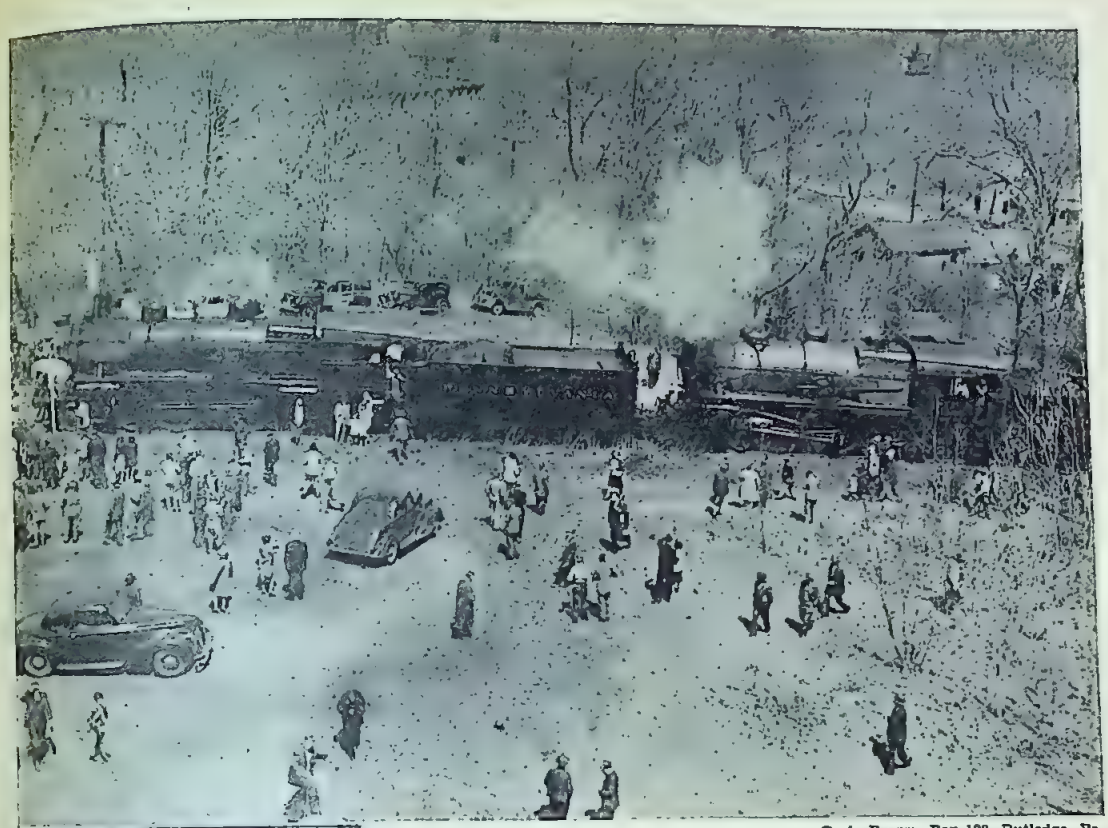


C. A. Brown, Box 128, Rutledge, Pa.

Pennsylvania RR.

Show this picture↑ to the average person and he wouldn't have the slightest idea of what was going on. But a railfan can identify it immediately as a fan trip, and can get a real kick out of studying the actions of his fellow enthusiasts. This particular trip was an off-the-beaten-path tour over historic Pennsylvania Railroad lines, and was highlighted by the inclusion of engine 6538 upon the request of George B. Hallowell and his son, shown← with Engineer George Marshall. Hallowell's father, now dead, regarded engine 6538 as his own, as he had operated it in passenger service for several years from the time it was new. Engine 6513, requested by Hallowell as an alternate choice, was also included on the excursion. It was the second engine↑ on the special train.

A Thrill Which Is Unique

Benhard's Grill, in Colfax, Calif., issues a periodical road-information bulletin for the benefit of motorists touring the West. Proprietor F. H. Benhard is a railfan at heart. He not only adorns his business cards with a railroad photo, but includes in his highway bulletin such choice bits of railfan enthusiasm as:

"The full moon on the fifth and the clear weather promised for the next few days provide an excellent opportunity for seeing the streamliner *City of San Francisco* ascending spectacular Cape Horn grade, 2 miles east of Colfax. The diesel train arrives in Colfax at approximately 8:45 p. m., and the helper steam engine (a 6000-horsepower articulated cab-in-front locomotive of the 4100 class of the Southern Pacific) takes water. As soon as the locomotive tank is filled and train orders have been received by the crew, the train leaves Colfax, approximately four minutes later.

"The best spot to watch is in the vicinity of Long Ravine. The double-powered train, a swiftly gliding yellow snake with dozens of lights on its sides, takes four minutes from the Colfax station to Long Ravine Viaduct, where the 2.55 per cent grade begins.

"The roaring exhaust of the cab-in-front locomotive and the throbbing of the three diesel units resounding from the heights of the mountains and the 1000-foot-deep American River Canyon provide a thrill which is unique, and which induces many a motorist to stop a while in Colfax, for nowhere else in the world can such a spectacle be witnessed except on the mountain section of the Sacramento Division of the Southern Pacific."

Dinner Date

Passengers on the Baltimore & Ohio's *Capitol Limited* no longer have to stand in line to get a seat in the diner. The railroad recently began reserving dining car seats.

RUNNING EXTRA

Roy Campbell is probably the "travelingest" man of the entire Kalmbach Publishing Co. staff. He outdistances even the editors of TRAINS in his travels as goodwill ambassador and sales manager of the company. He's practically never around the office, but when he is, a good part of the first day is spent in telling the editors what he saw and heard on his latest trip.

Roy's job takes him from coast to coast singing the praises of TRAINS and THE MODEL RAILROADER and other Kalmbach publications. He rubs elbows with top-ranking railroad officials while going through his TRAINS repertoire, circulates among hobby shops with his MODEL RAILROADER music, and when he visits the advertising agencies he manages to sing a duet. There is nothing high-pressure about Roy; his friendly, humorous nature and an understanding of the other fellow's problems are all he needs to accompany his "singing."

One reason Roy fits so well in his position is that he is genuinely interested in railroads himself. He's vice-president of the Railroad Society of Milwaukee, and he spends much of his spare time photographing railroads. His own railroad pictures have won awards in salon exhibitions, and his collection is one of the largest and finest in the Midwest. He's a sailing enthusiast too, and when he's not down at the yards or station with his camera the chances are he's at some dock, photographing ketches, yawls, yachts and other watergoing vessels.

Roy used to be president of the Wisconsin Accident & Health Insurance Company. After the firm was sold in 1942 he handled real estate for a while. He did well but didn't like it. He was just about to buy an insurance agency and get back into the swing again when he met Al Kalmbach on a train. They had been friends for years, and when Al heard Roy might be available if he spoke fast enough, Al signed him up. Roy's been with us now for nearly a year.

Railway

The Monon Issue

The all-Monon July issue of TRAINS is splendid. It is an outstanding issue and one of your best.

Alexander L. H. Darragh, Chairman, Northern Indiana Chapter, Railway & Locomotive Historical Society, South Bend 21, Ind.

TRAINS has certainly placed the Monon in the "Hall of Fame." We shall be eternally grateful for the additional evidences of your friendship so effectively mirrored in the July issue of your magazine.

John W. Barriger, President, Monon, 608 S. Dearborn St., Chicago 5, Ill.

I have just finished reading every word in the July issue of TRAINS — a tribute I seldom grant any magazine. Until I encountered this number, I knew the Monon only as a bankrupt, down-at-the-heels pike, likely to disappear from the American scene; now I am a staunch fan.

David Lloyd Stearns, 1733 S. E. Belmont St., Portland 14, Ore.

If I may have a vote, I'll vote against devoting any issue of TRAINS to any one road, such as in the July issue.

Granville Thomas, 31st St. and West Ave., Ocean City, N. J.

. . . If this experiment is truly successful, the color and glamour of the earlier years will be overshadowed. I hope you will reserve a future issue to the results of the Monon venture.

Frank S. Smith Jr., 1714 S. 3rd St., Louisville 8, Ky.

V&T Wants V&T Photographs

I am accumulating a file of photographs covering the Virginia & Truckee Railway with the intention of mounting them in permanent portfolios. Much of the history of this railway has been lost; hence my desire to recover from outside sources all data that is possible. Do you suppose TRAINS readers could help?

G. A. Sampson, Vice-President, Virginia & Truckee Ry., Carson City, Nev.

Trainman Must Throw the Switch

On many railroads (on all, as far as I know) it is absolutely against the rules for a signal maintainer or anyone in a similar capacity to throw a switch for a train crew [photo, page 24, June TRAINS]. As a matter of fact this safety rule also applies to all maintenance of way and structures department employees and to station and similar workers unless this duty has been officially assigned to them in special circumstances.

William S. Wollner, Executive Vice-President, Pacific Railway Club, P. O. Box 458, San Rafael, Calif.

RAILROAD WOMAN OF THE MONTH

As a school teacher she learned to manage mothers, and this experience in human relationships has helped make Mrs. Mabel D. Werner one of Burlington-Rock Island's outstanding ticket clerks. Mrs. Werner works alongside her station-agent husband, Sam, at Corsicana, Tex., where the Rock Island's *Twin Star Rocket* and the Burlington's *Sam Houston Zephyr* pause on their daily 250-mile runs between Fort Worth and Houston.

"During the war," writes the TRAINS reader who nominated Mrs. Werner as Railroad Woman of the Month, "when about 80 per cent of railway employees were treating passengers like undesirable aliens, this lady was courtesy itself, and did everything but serve coffee to her customers while they waited for the *Rocket* or the *Zephyr*."

Mrs. Werner began working for the railroad a little more than five years ago. She worked in the office at

Post Office

PRR Signals

The Pennsylvania Railroad uses position-light signals, not color-light, as stated in the caption on page 62 of June TRAINS. . . . Tonnage rating from Cambridge Junction to Swanton on the St. Johnsbury & Lake Champlain [May TRAINS] surely must be 825 tons, not 825 pounds!

Bob Adams, Business Manager, TRAINS.

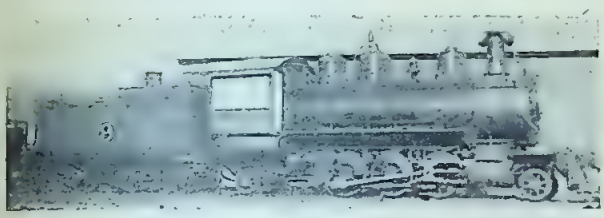
[Right you are, Bob; it was a slip in both cases. And "Running Extra" wins its wager (July TRAINS) that you will continue to be one of the editors' severest critics. — *Ed.*]

Nezperce & Idaho No. 9

If the picture on page 34 of June TRAINS is of Nezperce & Idaho locomotive No. 9, what do the letters YWRR on the tender stand for?

Stanley D. Crews, Lawrenceburg Hotel, Lawrenceburg, Tenn.

. . . The picture brought back fond memories of the times I rode in the lone combine behind this old girl on the McCloud River Railroad. She was purchased new (as a wood-burner; notice rack around top of tender in accompanying snapshot) by the McCloud River line around



1898 or 1900 along with three more engines of the same class. About 1920 she and her sisters were converted to oil-burners at the McCloud shops. Along about 1939 she was sold to the Yreka Western. . . . At my entry into the army in 1943 this engine was in daily operation on the Yreka Western, but on my discharge from the service she was no longer on the YW, and nobody could inform me as to her whereabouts. Apparently the Nezperce & Idaho purchased her from the Yreka Western. A striking coincidence about this engine is that she has carried her original "No. 9" throughout her entire career.

Raymond A. Pfitz, P. O. Box 426, McCloud, Calif.

Mrs. Mabel D. Werner
. . . "Courtesy itself"

Mexia, Tex., for three years, then was moved to Corsicana to be ticket clerk. She is an accomplished pianist and organist, and her main leisure time activities are concerned with music. Besides being president of the Nevin Music Group in Corsicana, she is active in the community's Fine Arts Club, Ensemble Piano Players, Twentieth Century Study Club, and the Board of Civic Music. She is also acting organist of the First Methodist Church, where she teaches Sunday School too. Mrs. Werner is the pianist and sweetheart of the Lions Club. She likes to garden but is even more fond of fishing, which, she says, allows her to "sit on the side of a stream, and not worry about whether or not I have a reservation." Her son, Sam Jr., is a student at Texas University.

SECOND SECTION

This is the month we've been waiting for. We're all set to install a new addressing machine to speed up the addressing of the envelopes for subscribers' copies of TRAINS and THE MODEL RAILROADER. And it had better get here right on schedule, or else. Or else we're going to have the pleasure of showing a certain publicity-wise salesman that we're people of our word.

You see, when it became apparent that we would have to have a better means of addressing magazine envelopes, we investigated and found that our best bet would be to throw out the old metal plate system and put in a new kind. The boss got together with the salesman about the delivery date. "Tell you what I'll do," said this p.-w. salesman. "I'll guarantee September 15 delivery if you'll write about the new system in your magazine."

"It's a deal," said the boss. "And for every day we have to wait beyond September 15 we'll take out one word of the write-up. The first word we'll take out will be your company's name."

Some month soon, we hope, Second Section will tell you a little about that new mailing machine. And maybe we'll even tell you who it's made by.

* * *

85 per cent more than you got before. Yes, 85 per cent more than you got before!

* * *

Sounds like some of that nerve-racking radio advertising, doesn't it? But you'll have to excuse us this time, because we're happy about the whole thing. And we want you to be happy too, so we'll tell you:

The November issue of TRAINS, bigger and better than ever before, will contain 85 per cent more material than TRAINS did six months ago. We have already added to the content since six months ago, but this November issue — and following issues — will be 45 per cent more magazine than the one you're reading right now. The price will remain 35 cents a copy, $4 a year. Why not subscribe *right now*, and be sure you'll get the November issue?

* * *

We think you'll like the new Trains Album of Photographs which is now on our presses. It deals entirely with circus trains, and it's practically a photo story of all the railroad activity involved in moving the Ringling Bros. and Barnum & Bailey Circus from city to city. Don't order it now, please; wait till we announce that it's ready. We just thought you'd like to know about it.

KALMBACH PUBLISHING CO.

1027 N. 7th St., Milwaukee 3, Wis.

A CENTURY of SERVICE

at the crossroads of America

Back in 1847—that's one hundred long years ago, some forward-looking Hoosiers wanted a railroad to meet increasing transportation needs.

They wanted to go faster than horses, and in carriers with a capacity much greater than that of any carriage or wagon.

They wanted *trains*—with chugging engines and clanging bells. Trains that had cars for people and cars for freight. And they wanted track—railroad track—that would lead to places they wanted to reach.

So these Hoosiers—like most typical Hoosiers—went to work and, with their own strong hands, literally built the first thrilling miles of track for the new railroad.

Naturally, these folks looked upon this new railroad as *their* railroad—an *intimate* thing—a *personal* thing that belonged to them for their personal use.

* * *

Ever since that time the Monon (an Indian name for "swift running") has been "our" railroad to the good people of Indiana. George Ade, James Whitcomb Riley, John T. McCutcheon and Booth Tarkington are only a few of the many famous Hoosiers who could be listed among these intimate "friends of the road."

They have all *thought* of it and *spoken* of it, have even *written* about and "*cartooned*" it, with the same sense of personal ownership that prompts Hoosiers to speak of "our *town*"—"our *school*"—"our *team*"—"our *church*"—"our *State House*"—"our *circle.*"

* * *

The Monon quickly became a part of the Indiana scene—a section of "Hoosier" life

moving on wheels and track—the train a Hoosier used whenever possible because it *was* a Hoosier institution—because it was a bit of "home" on wheels.

In these past one hundred years Monon has not always met the highest ideals of railroad service. It has had shortcomings, of course. But this same friendly road has served the people of Indiana *for one hundred years,* which is, in itself, deserving of recognition. For, be it human, animal or mechanical, nothing can live for 100 years without having something basically sound within it.

So it is that "the Hoosier Line"—one hundred years *young*—is today celebrating not only a full century of service to Hoosiers and others, but the beginning of a "*new century*" that involves the most amazing advances in modern engineering.

★ ★ ★

Today's MONON is a Diesel-powered interpretation of modern railroad service. It is a veritable "life-line" for Indiana—carrying the raw materials from its farms and mines and quarries—its many finished products and its people—from point to point throughout the state and making of Indiana a "corridor" which connects the Great Lakes with the South.

Passenger service on the new "Hoosier Line" will soon provide the newest and finest of streamlined, Diesel-powered trains with the newest innovations in travel comforts and conveniences, which will literally *float* with velvety smoothness on our modernized roadbed and track.

★ ★ ★

The MONON looks forward to the years ahead with confidence and optimism. Postwar improvements already made in service to shippers and passengers will be further augmented. With America's great railroad systems as a whole, the Monon sees 1947-48 . . . its 101st year . . . as the dawn of a new era in swift, safe and comfortable passenger service and "on time" operation of fast-scheduled freight trains.

When plans of the present management are fully realized, the *NEW* Monon will be *the most completely Diesel-powered railroad of its size in the nation.*

★ ★ ★

For the solid groundwork which has made possible our plans for the future, the present MONON management gives thanks to the patrons who have loyally *traveled* by and *shipped* by "the Hoosier Line" through the past century.

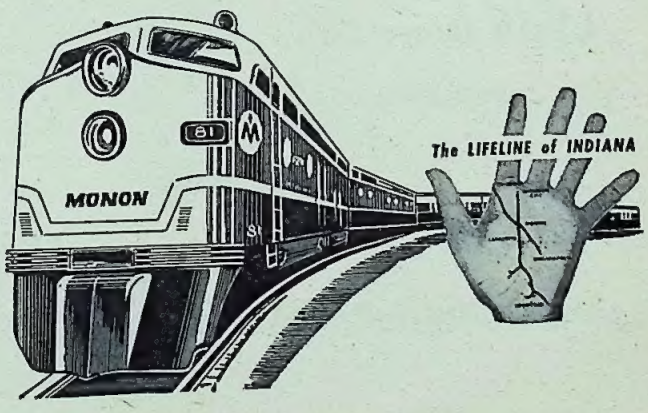
For, after all, it is *people* and *people alone* who can put the warm blood and beating heart of *life* into a railroad—*for a hundred years.*

CHICAGO, INDIANAPOLIS AND LOUISVILLE
RAILWAY COMPANY

John O. Barriger
President

MONON

THE HOOSIER LINE



Railroad Post Office *(Continued)*

Six-Sevenths of a Locomotive

Madison, Wis., has a railroad mystery of disturbing proportions. The schedule posted in the Milwaukee Road depot lists the arrival of 89 trains every week, but the departure of only 83. That gives Madison a surplus of six locomotives every seven days, or six-sevenths of a locomotive per day. The circumstances suggest the existence of *(a)* a secret underground cavern for hiding extra locomotives; *(b)* long trains of nothing but locomotives pulling out of Madison, say, once a year; *(c)* weekly auctions with the highest bidders hauling away locomotives by their own devices; and *(d)* a giant evaporator where the dispatcher can send locomotives when they start cluttering up the yards. All I know is that none of my observers have ever seen six-sevenths of a locomotive sneaking out of town even on a dark night. Max W. Mueller, 2646 E. Johnson St., Madison 4, Wis.

Sees Profit in Utah-Idaho Central

Why doesn't the Southern Pacific or the Rio Grande buy the defunct Utah-Idaho Central? It would give either road a valuable feeder line into the fertile Cache Valley as far as Preston, Ida. The U-IC failed because there wasn't enough business to justify its existence as an independent carrier, but if the cost of maintaining general offices and shops were eliminated and if electrical operation were discontinued and the traffic handled by diesel switchers, enough should be saved to make the line profitable.

John A. Elliott, C. T. C. Gange, UP RR., Caliente, Nev.

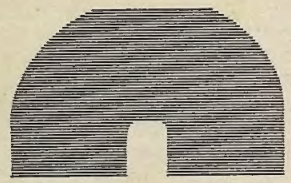
New Railroad Book

My American Pilgrimage, by Stoyan Christowe. 264 pp., 5¼" x 7½". $2.50. Little, Brown & Co., Boston.

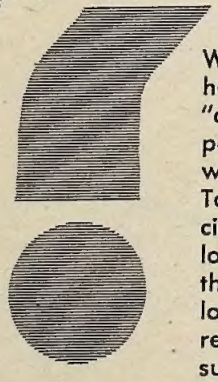
In this book, immigrant Stoyan Christowe tells how he became an American. His first work was railroading in the St. Louis terminal and later on the Great Northern system.

While working on the tracks of the GN in Montana young Christowe realized the vastness of our United States and renewed his determination to "become an American." Box car heralds became lessons in geography and Pullman names became studies in American history. He thrilled at the sight of the *Fast Mail;* and even the *Skidoo,* which made all stops between its division terminals in North Dakota and Montana, symbolized rural living.

The story is plainly told with a charm almost Biblical in its simplicity. This is a book to read and then put on the shelf with Emerson and Whitman. — *F. P. D.*



PETROLEUM PIGS PASSENGERS



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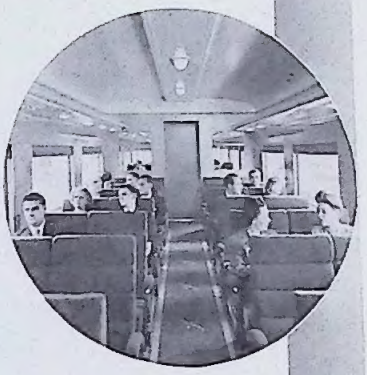
Thrill to the *Whippoorwill* between CHICAGO and EVANSVILLE



SOUTHBOUND (Read Down)	NORTHBOUND (Read Up)
5:20 pm Lv Chicago	Ar 11:59 am
5:34 pm Lv Englewood	Ar 11:44 am
5:57 pm Lv Chicago Heights	Lv 11:22 am
6:50 pm Lv Milford, Ill.	Lv 10:28 am
7:03 pm Lv Hoopeston, Ill.	Lv 10:17 am
7:33 pm Lv Danville, Ill.	Lv 9:55 am
8:33 pm Lv Terre Haute, Ind.	Lv 8:55 am
8:58 pm Lv Sullivan, Ind.	Lv 8:28 am
9:28 pm Lv Vincennes, Ind.	Lv 7:56 am
10:01 pm Lv Princeton, Ind.	Lv 7:24 am
10:40 pm Ar Evansville, Ind.	Lv 6:50 am

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15. Great Northern Railway
16. The Burlington Route

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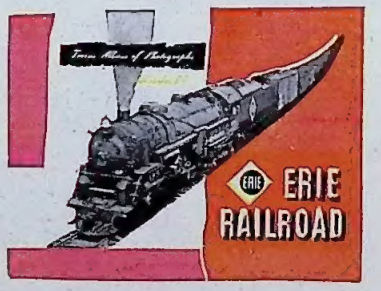
TRAINS Albums are superb collections of modern rail photographs, prefaced with introductory text and a descriptive caption for each photo. The subjects are dramatic power examples . . . the backgrounds, extraordinarily scenic. Each album is a separate, complete photo story of a railroad or of the railroads of a certain type of section of the country.



These albums are printed from finest quality plates with special glossy ink on one side of the page only. The reproductions are equal to the original glossy photos and may be clipped for framing without impairing the balance of the book. The pages, 10" x 14", are bound with colorful plastic; the heavy covers are printed in 2, 3, or 4 colors.

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A connoisseur's item, Mixed Train Daily contains superlative action photos . . . 300 in all. Combined with the author's work are photographs by C. M. Clegg and full-color plates of Howard Fogg's oil paintings.